Terminal-Emulation (VT100) User Guide and LCD Front Panel Status Guide

June 5, 2000

P/N: 775069-00 Rev. A

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Part Number 775069-00 Rev. A

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This manual describes procedures and functions available through the Terminal-Emulation (VT100) interface utility.

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About this Manual

This user guide is designed to provide operations and reference information for the experienced system administrator or computer technician who is familiar with the principles and conventions of Small Computer System Interface (SCSI), Fibre Channel Interface, and Redundant Array of Independent Disks (RAID) technology.

This user guide supports the following Mylex controllers:

- FF—Fibre Channel to Fibre Channel RAID Controller
- FFx—Fibre Channel to Fibre Channel RAID Controllers
- FF2—Fibre Channel to Fibre Channel RAID Controller

This user guide supports firmware versions 7.x and greater.

☛Note

Conventions

Throughout this manual, the following conventions are used to describe user interaction with the product:

For entering key strokes:

<Ctrl> Press the key indicated using the keyboard.

Enter Press the key labeled Enter.

ESC Press the key labeled Esc or ESC.

The following fonts and symbols indicate additional useful information or of situations where special care is required:

> ☛**Note**
>
> Supplementary information that can be useful

> ⚠ ***Caution***
>
> Notification that an action has the *potential* to adversely affect equipment operation, system performance, or data integrity

> **WARNING**
>
> **Notification that an action results in equipment damage, data loss, or personal injury**

Related Documentation

The following documents are available from Mylex Corporation and provide additional information.

Global Array Manager Installation Guide and User Manual, PN 771961

OEM System Reference Manual, PN 771992

Firmware/Software Interface Reference Manual, PN 775067

Encyclopedia of Controller Fundamentals and Features, PN 775041

DACFF Quick Installation and Configuration Guide, PN 775063

FFx Quick Installation and Configuration Guide, PN 775047

FF2 Quick Installation and Configuration Guide, PN 775061

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Chapter 1
Introduction and Navigation

Overview

After hardware installation (refer to the appropriate Installation Guide for specific installation instructions for each Mylex controller), the array can be configured through one of the following user interfaces:

- VT100 terminal-emulation interface connected through the controller's serial port (referred to as VT100 throughout the remainder of this manual).
- Global Array Manager (GAM) software running on a PC. Refer to the *Global Array Manager Client Software Installation Guide and User Manual*.

This chapter provides the user with step-by-step instructions for accessing and navigating the VT100 user interface. At the end of the chapter are a few commonly used procedures and an outline of the steps necessary to perform each.

LCD Front Panel Support

Beginning with firmware version 7.0, LCD Front Panel functionality is limited to status-only display. The keypad support provided in previous firmware releases is no longer functional. The status messages are similar to those displayed on the VT100 screen. A list of status messages is provided in Appendix A.

Using the VT100 Terminal-Emulation User Interface

> **☛Note**
>
> Although the built-in configuration and administration utility provides safety prompts that alert you when you are about to take an action that can affect data or drive status, this interface is meant to be used only by persons with appropriate training and responsibility for the system. This book is written for an audience that possesses a working knowledge of SCSI, Fibre Channel, serial communications, and RAID technologies.

Making changes to an existing configuration requires caution and planning—the utility cannot prevent the user from reconfiguring and initializing disk areas where data resides. For best results, have on hand a written plan that identifies the system resources and the logical drive configuration you intend to create or modify.

Use the built-in utility to:

- Configure, save, and initialize arrays
- Administer, manage, and monitor arrays

Configure, Save, and Initialize Arrays

The primary purpose of the built-in utility is to create logical devices, addressable by the operating system, from an array of physical disk drives. The Mylex controller serves as the interface between the operating system and the logical devices.

Using the VT100 interface, you can define the size of logical devices, assign RAID levels, and define customized LUN (Logical Unit Number) mapping schemes. Controller Parameters allow you to change settings as needed for your configuration.

After creating the logical devices, the configuration is saved. The saving process writes configuration information, configuration on disk (COD), to each physical drive and controller in the configuration. This information is retrieved from the physical drives in the event of controller replacement.

Initializing the new configuration clears all data currently on the devices and synchronizes the parity and mirror information, thus making the logical devices readable. Failure to initialize logical devices results in a parity error.

The utility does not allow for automatic configuration. The user is responsible for determining all configuration parameters for newly created arrays.

Administer, Manage, and Monitor Arrays

After you have configured and initialized an array, you can continue to use the VT100 interface to manage the array when system or hardware malfunctions occur that could put stored data at risk. The built-in utility provides the tools to change device states, and to rebuild (reconstruct) data on a replacement drive. If you experience a power loss resulting in possible data corruption, use the utility after power restoration to perform a consistency check. The consistency check can locate and correct, if necessary, any data errors on the drives.

The VT100 displays error or status messages showing the current status of the logical devices, physical drives, and controllers.

Again, the VT100 interface does not allow for automatic operation of many of these features. The user is responsible for determining the parameters for managing and changing arrays.

Configuring for VT100 Terminal-Emulation Mode

Refer to the appropriate controller installation guide for requirements to configure the serial port for terminal emulation. Some controllers require jumper settings. The jumpers are located on the distribution board and vary between controllers. Some controllers require configuration bit settings and firmware header settings.

By connecting a VT100 compatible terminal, or a PC operating in an equivalent terminal-emulation mode, basic controller functions can be exercised from the VT100 terminal. Mylex has tested the VT100 User Interface with the following terminal-emulation programs: Terminal.exe, available with Windows NT version 3.5; Hyperterminal.exe, available with

Windows NT version 4.0, Tip available on Solaris systems, and CU available on IRIX systems. Tip and CU require the user to open an Xterm window then run Tip and CU to the open serial ports.

Configure the host settings to the values shown in Table 1-1 to ensure proper communication between the terminal emulation program and the controller.

Table 1-1. Terminal-Emulation Interface Requirements and Settings

Terminal	Requirement
Connection	Null-modem cable
Protocol	Asynchronous, RS232
Baud rate	19,200
Data bits	8
Stop bits	1
Parity	None
Flow control	None

Access the user interface by pressing <**@**> (shift-2) or the <**Ctrl**> and <**Break**> keys together.

Commonly Used Keys and Command Options for the VT100

The VT100 user interface options use the following keys and command options for several procedures:

- **ESC**—Allows the user to go back to the previous screen or exit the current procedure.
- **Enter**—Executes the selected functions.
- **Number and Letter Keys**—Can be used to enter a value or to select an option as prompted on the screen.

Navigating the VT100 Terminal-Emulation Screens

Starting the User Interface

After the controller has been powered on, the STARTUP COMPLETE message displays ON the VT100 terminal or the LCD. The terminal monitor screen displays the status messages in the line below the **MESSAGE:** prompt.

Startup Complete Screen

Any status message displayed in this line remains on screen until one of the following occurs:

- Controller operations generate a new status message in its place.
- Someone issues a *Break* command, executing the Main Menu.
- Someone presses **ESC**, causing the controller to exit the utility.

Start the built-in configuration and administration utility by issuing the *Break* command. The Main Menu displays.

Main Menu Screen

Respond to the on-screen prompts to select the desired menu.

Typing the number associated with a menu item in the OPTIONS: list (such as **1**) causes the number to appear next to the ENTER PARAMETER: prompt.

Pressing **Enter** activates the selected function.

When a menu item is selected, its number appears next to the OPTIONS: prompt to verify its selection.

Pressing the **ESC** key allows you to go back to the previous menu at nearly any point in the menus.

Menu Structure

Table 1-2 provides a quick-reference guide to menu structure. This table also provides reference pages for locating the description of each menu item.

Table 1-2. Controller Menu Screen Locator

Main Menu Selection	Submenu Title
"Configure, Check Drive States" on page 2-11 and page 3-1	"View Current Configuration" on page 3-1
	"Create New Disk Packs" on page 2-14 and page 3-13
	"Clear Configuration" on page 2-11 and page 3-14
	"Show Drives, Change Drive State" on page 3-14
	"Search for Physical Devices" on page 3-23
	"Add Logical Drive to Existing Physical Device Packs" on page 3-24
"SANmapping™" on page 2-31	
"Information and Parameters" on page 2-1	"Get Controller Information" on page 3-33
	"Get Logical Device Information" on page 3-37
	"Get Physical Device Information" on page 3-39
	"Get and Set Controller Parameters" on page 2-6 and page 3-41
	"Get and Set Logical Device Parameters" on page 3-41
	"Get and Set Physical Device Parameters" on page 3-46
	"Get Physical Device Statistics" on page 3-50
"Start or Stop Long Ops" on page 3-51	"Start Foreground Initialization" on page 2-43 and page 3-51
	"Stop Foreground Initialization" on page 2-46 and page 3-51
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	"Stop Consistency Check" on page 3-54
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	"Stop Consistency Check with Restore" on page 3-58
	"Start Rebuild" on page 3-60
	"Stop Rebuild" on page 3-63

Table 1-2. Controller Menu Screen Locator

"Controller and Host Operations" on page 3-65	"Get Dual Controller Status" on page 3-65
	"Kill Partner" on page 3-70
	"Relinquish Controller" on page 3-72
	"Reset Controller or Channel" on page 3-74
	"Get Host WWN Table" on page 3-76
"Change Serial Port Usage" on page 3-77	

Commonly Used Procedures and Troubleshooting Guide

This section provides roadmaps for some of the most commonly used procedures and emergency situations. Use these roadmaps to make sure you cover required steps when using the VT100 to configure a new array, replace a failed disk drive, or replace a failed controller.

Creating a New Configuration

Use this procedure when you want to set up a new system or clear an existing configuration and replace it with a different configuration.

Step No.	Action	Description	Where to find instructions
1.	Check and change any parameters, if necessary.	Make any required changes to controller parameter settings. Controller reset may be required for some parameter changes. Refer to Table 2-1 on page 2-2 for a description of parameters and resetting requirements.	"Get and Set Controller Parameters" on page 2-6.
2.	Clear the configuration.	Clear any existing configurations before creating a new configuration. (This step may not be necessary.)	"Clear Configuration" on page 2-11.
3.	Create the configuration.	Manually configure physical devices into an array.	"Create New Disk Packs" on page 2-14.

Step No.	Action	Description	Where to find instructions
4.	Alter the logical device accessibility.	Make any changes to logical device accessibility through SANmapping.	"SANmapping™" on page 2-31.
5.	Initialize the logical devices.	Initialize the newly created logical devices.	"Start Foreground Initialization" on page 2-43.

Adding New Disk Drives to Your Controller

Use this procedure to expand your array's storage capacity by adding disk drives.

Step No.	Action	Description	Where to find instructions
1.	Install the new disk drive(s).	Follow the hardware instructions to install the new disk drives.	Disk drive installation guide.
2.	OPTIONAL Supply power to drive enclosure.	Power must be supplied to the enclosure if installing a new enclosure with drives.	Your enclosure guide.
3.	Show the drive(s).	Verify that the controller recognizes the new drive(s).	"Show Drives, Change Drive State" on page 3-14.
4.	OPTIONAL Reset the controller(s).	A controller reset may be required if the new drive(s) are not recognized by the controller. This step is dependent on the enclosure.	"Reset Controller or Channel" on page 3-74.
5.	Show the drive(s).	Verify that the controller recognizes the new drive(s).	"Show Drives, Change Drive State" on page 3-14.
6.	Create a new array.	Create a new configuration using the additional drives now available.	"Creating a New Configuration" on page 1-8.

Replacing a Failed Simplex Controller

Replacing a controller in a simplex (single controller) system is relatively easy. The replacement controller obtains the configuration information from the configuration on disk (COD) from the existing disk drives. This procedure may require a ‘controller reset during the COD update process.

Step No.	Action	Description	Where to find instructions
1.	Power off the controller.	If possible, leave power to the disk drives; otherwise, power off the entire enclosure.	Your controller installation guide or your enclosure guide.
2.	Remove the failed controller.	Follow the hardware instructions to remove the failed controller.	Your controller installation guide and/or your enclosure guide.
3.	Insert the replacement controller.	Follow the hardware instructions to insert the replacement controller.	Your controller installation guide and/or your enclosure guide.
4.	Power on the controller, and/ or enclosure if powered off in step 1.	The controller accepts the configuration from the disk drives.	Your controller installation guide and/or your enclosure guide.

Replacing a Failed Dual-Active Controller

Your LCD, LED indicators or other on-line monitoring tool indicates when a controller has failed. When you replace a controller it recovers its configuration from the surviving controller. This procedure may be performed with power supplied to the controllers or power turned off.

> **☛Note**
>
> Both controllers in a dual-active configuration must be identical with respect to memory and firmware version and type.

Several controller parameters affect the amount of user intervention necessary when replacing failed controllers.

- Auto Failback
- Node Name Retention

Step No.	Action	Description	Where to find instructions
1.	Indentify the failed controller.	The enclosure indicator lights show which controller has failed. The VT100 message line also provides a partner controller status message.[a]	Your enclosure guide.
2.	OPTIONAL Power off the failed controller, if performing a cold (power off) replacement.	If possible, leave power to the disk drives; otherwise, power off the entire enclosure.	Your controller installation guide or your enclosure guide.
3.	Insert the replacement controller.	Follow the hardware instructions to insert the replacement controller. If the power has remained on, the replacement controller accepts the configuration from the surviving controller.	Your controller installation guide and/or your enclosure guide.

Step No.	Action	Description	Where to find instructions
4.	OPTIONAL Power on the controller, if performing a cold (power off) replacement.	The controller accepts the configuration from the disk drives. The replacement controller accepts the configuration from the suviving controller during the startup	Your controller installation guide and/or your enclosure guide.
5.	MAY SKIP THIS STEP Relinquish the replacement controller.	If Automatic Failback is disabled, use the Relinquish Controller option to bring the controller online. If Automatic Failback is enabled, no action is required.	"Relinquish Controller" on page 3-72.
6.	Reboot the host.	Rebooting the host allows the host to recognize the controller as a replacement.	Host computer user guide.
7.	Access VT100 User Interface.	Type <@> to access the VT100 User Interface.	"Configuring for VT100 Terminal-Emulation Mode" on page 1-3

a. The surviving controller displays a "Partner Failed" message. The failed controller displays no message and the VT100 User Interface is unresponsive.

Replacing a Failed Disk Drive

All RAID 1, 3, 5 or 0+1 logical devices associated with a failed disk show an online critical status in the Logical Device States screen. A failed disk drive shows an offline failed status in the Physical Device States screen. Refer to "Show Drives, Change Drive State" on page 3-14.

The Automatic Rebuild feature performs this operation without user intervention if the following conditions are met:

1. An online spare disk drive of identical or larger size is found attached to the same controller;
2. All system drives that are dependent on the failed disk drive are configured as a redundant array; RAID 1, RAID 3, RAID 5, or RAID 0+1;

3. *Automatic Rebuild* controller parameter is enabled;
4. *Operational Fault Management* controller parameter is enabled.

Note

The Mylex controller always attempts to first locate a replacement (online spare) disk drive that is exactly the same size as the failed disk drive. If none is found, the controller then attempts to locate a replacement disk drive that is at least the same size as the failed disk drive.

WARNING

Removing the wrong physical device (disk drive) constitutes a second point of failure and forces the logical device offline resulting in potential data loss.

Step No.	Action	Description	Where to find instructions
1.	Identify the failed physical device (disk drive).	Verify the failed drive through LED indicators on the enclosure or by performing the Show Drives, Change Drive State function.	Your disk drive user guide; enclosure guide; or "Show Drives, Change Drive State" on page 3-14.
2.	Remove and replace the failed disk drive in the same location.	Follow the hardware instructions to remove the failed disk drive and replace it.	Your disk drive installation guide.
3.	Start the rebuild procedure.	If Automatic Rebuild and Operational Fault Management are enabled, the rebuild starts within a few minutes of detecting the replacement drive.	"Information and Parameters" on page 2-1.

If the above conditions are *not* met, inserting a new drive and starting a rebuild of the redundant array requires the user to perform the following procedure.

Step No.	Action	Description	Where to find instructions
1.	Identify the failed physical device (disk drive).	Verify the failed drive through LED indicators on the enclosure or by performing the Show Drives, Change Drive State function.	Your disk drive user guide, enclosure guide or "Show Drives, Change Drive State" on page 3-14.
2.	Remove and replace the failed disk drive in the same location.	Follow the hardware instructions to remove the failed disk drive and replace it.	Your disk drive installation guide.
3.	Change the replacement drive's state.	The drive state for the replacement drive is Offline Failed. The drive state must be changed to Online Spare.	"Show Drives, Change Drive State" on page 3-14.
4.	Start the rebuild procedure.	Initiate the rebuild procedure.	"Start Rebuild" on page 3-60.

Recovering Multiple Failed Disk Drives

Instances occur when several disk drive states are set to offline failed. This might occur when replacing a failed disk drive and a working drive is inadvertently removed forcing the logical device to an offline failed status. This might also occur when adding an enclosure of drives and inadvertently leaving power off to the enclosure.

While the following procedure does not guarantee full data recovery, in most instances the data is restored without significant loss.

WARNING

This recovery procedure must be implemented before any data is written to the disks. The working disk drive must be re-inserted before the failed disk drive or potential data loss may occur.

Step No.	Action	Description	Where to find instructions
1.	Replace the working physical device, or supply power to devices.	Verify through LED indicators on the enclosure that power is supplied to the devices.	Your disk drive user guide, enclosure guide.
2.	Change the drive(s) state(s).	The default drive state for new devices is Unconfigured Offline. Since these devices were functioning normally, return the drive state to Online Optimal.	“Show Drives, Change Drive State” on page 3-14.
3.	Continue with failed drive replacement procedure, or continue as usual.	After returning devices to Online Optimal state, logical devices also return to Online Optimal or Online Critical state and continue functioning as usual.	“Replacing a Failed Disk Drive” on page 1-12.

Recovering From Lost Logical Device Accessibility

Logical devices are accessible to the host through the controller. SANmapping determines which controller, controller/host port, and host has access to each logical device. During controller failure, this accessibility is assumed by the surviving controller. When a replacement controller is inserted into the system, the replacement controller assumes the logical device access of the failed controller. There are several controller parameters that make this process transparent to the user. However, if these parameters are not set appropriately, the replacement controller may not have access to the failed controller's logical devices. The easiest way to recover from this situation is to restart the host computer operating system. This will allow the host to recognize the replacement controller and forward logical device accessibility from the failed controller to the replacement controller. The following procedure guides you through the steps necessary to recover from this situation.

Step No.	Action	Description	Where to find instructions
1.	Remove and replace the failed controller.	Follow the hardware instructions to remove the failed controller and replace it.	"Replacing a Failed Simplex Controller" on page 1-10 or "Replacing a Failed Dual-Active Controller" on page 1-11.
2.	Reboot the host system.	Cycle power or restart the host computer.	Host computer user guide.

Chapter 2
Setting up a new Configuration

This chapter provides instructions for creating, saving, and initializing a new configuration.

Configuring Simplex and Dual-Active Controllers

If you are using two controllers and have installed the hardware in a dual-active configuration, you need to configure one controller only. When the configuration is saved, it is automatically saved to both controllers.

If you are using multiple simplex controllers, you must configure each controller separately.

Information and Parameters

Each Mylex controller is shipped from the factory with initial settings that have been found to work well in a majority of applications and environments. These settings are listed as the controller, logical device, and physical device parameter default settings and vary depending on the product and user requirements. User requirements are not always the same as the suggested default settings, so you may want to modify certain settings. Additionally, if you are going from a simplex configuration to a dual-active controller configuration, certain controller parameters have to be changed to accommodate the new dual-active configuration.

> **☞Note**
>
> Logical device and physical device parameters are discussed in Chapter 3. These parameters cannot be modified until after a configuration has been created. Refer to “Get and Set Logical Device Parameters” on page 3-41 and “Get and Set Physical Device Parameters” on page 3-46 for more information.

Table 2-1. Controller Parameters

Parameter	Reset Required	Default	Description
1. Reassign Restricted to One Block	Yes	0—Disabled	Set: All reassigns are for the single failing block. Clear: All reassigns are for the entire current I/O.
2. True Verify	Yes	0—Disabled	Set: If enabled and data is transferred, then a true verify with data comparison is performed. Clear: No data comparison.
3. Disk Write Through Verify	Yes	0—Disabled	During error handling this turns on Force Unit Access for reads and writes.
4. Read Ahead Enable		1—Enabled	Allows the controller to read into cache a full stripe of data at one time.
5. Automatic Rebuild Management	Yes	1—Enabled	Allows the controller to take autonomous actions when a failed disk has been replaced.
6. Operational Fault Management	Yes	1—Enabled	Allows the controller to take autonomous actions when a failure occurs.
7. Super Read Ahead	Yes	0—Disabled	The Super Read Ahead function increases performance by always reading an extra cache line on a read request, and reading a further cache line when a cache hit occurs on a pre-fetched cache line.
8. Rebuild and Check Consistency Rate	No	50	Sets the initial value of the Rebuild and Consistency Check rate. Range=0-50
9. Device Combing	No		Enables data traffic coalescing on the traffic of each device, joining data from adjacent I/Os into a single I/O to improve performance.
10. Disk Startup Mode	Yes	0—Autospin	AUTOSPIN: Issues start to all devices automatically PWRSPIN: Devices spin on power application. WSSUSPIN: Await SSU, then start devices per AUTOSPIN. 0=Autospin 1=Pwrspin 2=Wssuspin
11. Startup Number of Devices	Yes	2	Sets the number of physical devices that spin-up at one time.
12. Startup Delay 1	Yes	6	Specifies the number of seconds between physical device spin-ups or start-up commands. Range=0-255

Table 2-1. Controller Parameters (Continued)

Parameter	Reset Required	Default	Description
13. SCSI Startup Delay 2	Yes	0	Can be set to a number of seconds for a motor spin delay or sets the number of seconds between start-up cycles. Range=0-255
14. Vendor Unique Test Unit Ready	Yes	0—Disabled	Set: A TUR command sent to an offline LUN returns hard error status. Clear: A TUR command sent to an offline LUN returns Not Ready Status.
15. Disable Check Condition for Invalid LUN	Yes	1—Enabled	Set: The Inquiry command returns “Perifpheral Not Connected” for invalid LUN. Clear: The Inquiry command returns “Illegal Request, LUN Not Supported” for invalid LUN.
16. No Pause on Controller Not Ready	Yes	0—Disabled	Set:Turns off the pause for the affected commands when the controller is not fully started. Clear: Turns on the pause for the affected commands when the controller is not fully started. Affected commands are: Prefetch, Read/Write, Read/Write Extended, TUR, Verify, and Write Verify.
17. Disable Queue Full Status	Yes	0—Disabled	Set: Returns Busy status when controller detects a queue full condition. Clear: Returns Queue Full status when controller detects a queue full condition.
18. Disable BUSY Status During Failback	Yes	0—Disabled	Set: Drops new requests during failback/cache flush operation. Clear: Returns Busy status during failback/cache flush operation.
19. SAF-TE Data for UPS Support	No	0—Enabled	Set: SAF-TE monitoring of UPS is disabled. Clear: SAF-TE monitoring of UPS is enabled if supported by the system enclosure.
20. Node Name Retention	Yes	0—Disabled	Set: A replacement controller assumes the node name of the failed controller after failback. Clear: A replacement controller uses its own node name after failback.
21. Failover Topologies—Transparent Inactive Port Failover	Yes	0	Requires the use of 2 ports, an active port for normal traffic and an inactive port for the partner controller’s traffic when it is failed over. Recommended only for FF controller.
21. Failover Topologies—Multiport Failover	Yes	1	Requires alternate path software. All four host ports are connected to individual fibre loops.

Table 2-1. Controller Parameters (Continued)

Parameter	Reset Required	Default	Description
21. Failover Topologies—Clustering Failover	Yes	2	Requires Clustering operating system. This topology is not supported at this time.
21. Failover Topologies—Transparent, Multiple TID Failover	Yes	3	Requires ISP2200 (FFx and FF2). All ports are active with 2 ports sharing a loop.
21. Failover Topologies—Master-Slave	Yes	4	Controller 0 has both ports active while controller 1 has both ports inactive. Controller 1 becomes active if controller 0 fails. Not recommended with FW version > 5.4.
22. Override Multiport Reset	No	0—Disabled	Set: An internal reset is executed by a port only if a logical device has been reserved through that port. Clear: Internal resets are not qualified by logical device reservations.
23. Reset Propagation	No	0—Disabled	Set: A port that executes an Internal Reset propagates the reset by causing a Reset Event to occur on its attached interface. Clear: A port will not cause a Reset Event on its attached interface as part of executing an Internal Reset.
24. Serial Port Baud Rate	Yes	6—19200	This item sets the baud rate of the serial port when in VT100 or Debug modes. 3=2400 4=4800 5=9600 6=19200
25. Serial Control	Read Only	Not Applicable	Serial parameters such as data bits, stop bits, parity on/off.
26. Serial Port Usage	Yes	1—SLP/VT100	Sets the serial port to either debug mode or SLP/VT100 mode. Debug mode is for development use only. 0=Debug 1=SLP/VT100
27. Frame Size Control	Yes	0—Long, 2KB	Allows adjustment of the Fibre Channel chip's frame size. 0=long, 2KB 1=short, 512 bytes 2=medium, 1KB
28. Smart Large Host Transfers	No	0—Enabled	Allows selection of Coalesce on host data tranfers. This takes affect for transfers larger than the stripe size. 0=Coalesce into one transfer 1=Transfer as available

Table 2-1. Controller Parameters (Continued)

Parameter	Reset Required	Default	Description
29. PCI Latency Control	Yes	0—Short	Allows adjustment of the Fibre Channel chip's use of the PCI bus. This takes effect only when both ports are active. 0=short 1=medium 2=long
30. Automatic Failback	Yes	0—Disabled	Allows the surviving controller to automatically sense and place an inserted replacement controller back in service.
31. Force Simplex	Yes	0—Disabled	Allows dual-active firmware to serve in a single controller environment.
32. Conservative Cache Mode	No	0—Disabled	Allows a controller an extra degree of data safety when operating in failed over condition. This turns off Write-Cache while the failed over condition persists.
33. Duplex Fault Signals	Yes	0—Disabled	Informs a controller that certain signals should be used to detect the presence or absence of a partner controller.
34. Duplex Fault Signals on Channel 4	Yes	0—Disabled	SX Hardware only.
35. Host SCSI Reset Delay	Yes	0—No Reset	SCSI only Allows a controller to reset the host in failover and failback situations. 0=No Reset 1-14=Reset delayed 15=Resets immediately
36. Simplex—No Reset	Yes	0—Disabled	Simplex only. Allows a controller to not assert the reset signal to the partner controller.
37. Queue Limit	No	32	Sets the maximum allowed queue depth for tagged commands to each attached drive. Range=1-230
38-41. Hard Loop IDs	Yes	Set for each controller/host port	Allows for the use of the same Loop IDs all the time.
42-43. Controller Name	Read Only	Not Applicable	Allows the controllers to have user assigned names.

Get and Set Controller Parameters

Before making any changes to the default parameter settings, please read the descriptions of the parameter settings provided in Appendix B and fully understand the implications of the change that is about to be made. Refer to Table 2-1 on page 2-2 for a listing of all controller parameters. The default settings, controller reset requirement, and a short description of each parameter is provided.

> **WARNING**
>
> **Saving parameter changes causes the controller's working parameters to change. This can produce unpredictable results if it occurs during host/drive activity. Stop all controller activity before saving parameter changes.**
>
> **Inappropriate changes to the parameter settings can result in degraded performance or data loss.**

If you intend to change any of the controller parameters, it is beneficial to do so *before* creating your array configuration.

> **Note**
>
> The number of physical and logical devices shown in the screen captures are an example configuration to show most of the features available on the VT100. These examples may not reflect your system or configuration.

To change a controller parameter:

1. Find the parameter you wish to change in Table 2-1.
2. Select Information and Parameters from the Main Menu by typing **<2>**. Press **Enter**.
3. Select Get and Set Controller Parameters by typing **<3>**. Press **Enter**.

   A partial list of controller parameters appears showing the current settings.

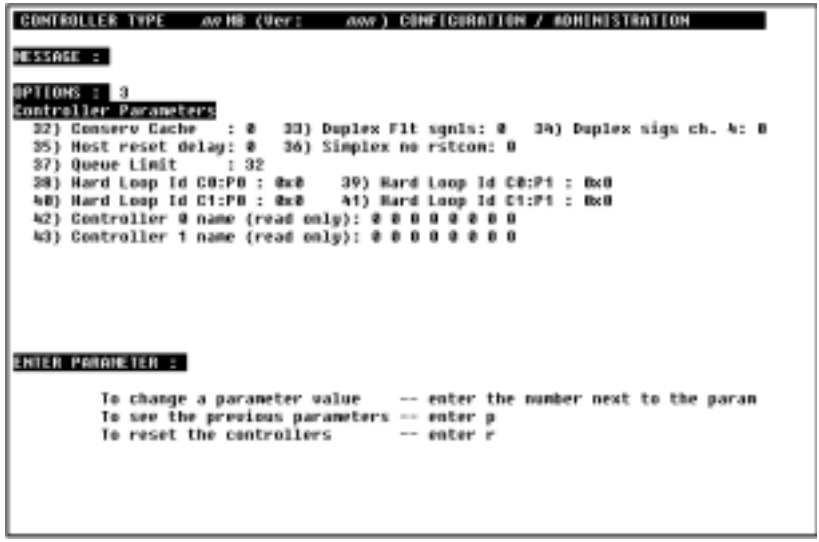
☛Note

Refer to Table 2-1 on page 2-2 and Appendix B for Controller Parameter information and default settings.

CONTROLLER TYPE awMB (Ver: awe) CONFIGURATION / ADMINISTRATION
MESSAGE :
OPTIONS : 3
Controller Parameters
1) Reassign one sec: 0 2) True Verify : 0 3) Wrt Thru Verify : 0
4) Read Ahead Enable: 1 5) Auto Rbld Mgmt : 1 6) Oper Fault Mgmt : 1
7) Super Read Ahead : 0 8) Check Con Rate : 50
9) Device Combing : 0 10) Disk Start-up Wd: 0
11) Num Devs Start : 2 12) Start Dly 1 : 6 13) Start Dly 2: 0
14) UU TUR sense : 0 15) Dis check cond : 1 16) Cmd Pause(on/off): 0
17) Disable Que Full : 0 18) Dis BSY status : 0 19) SAF-TE UPS Data : 0
20) FO name retain : 0 21) FO params : 0
22) Multiport reset override : 0 23) Propagate reset: 0
24) Serial baud : 19200 25) Serial params r/o: 0x12 26) Ser Port Use :SLPUT
27) Frame Control : 0 28) Sm/Lrg Host Xfers: 0 29) PCI Latency : 0
30) Auto Failback : 0 31) Force Simplex : 1
ENTER PARAMETER :
To change a parameter value -- enter the number next to the param
To see more parameters -- enter m
To reset the controllers -- enter r

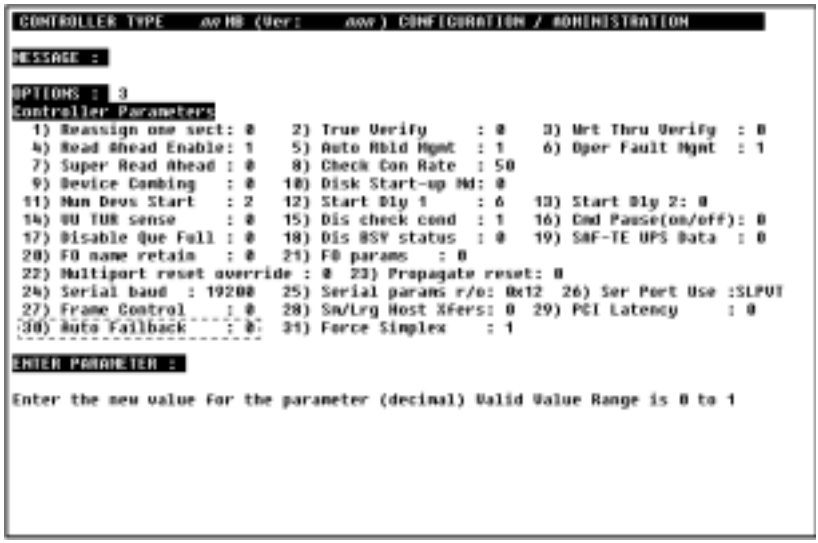
Controller Parameters, First Screen

4. Type **<m>** to see additional controller parameters. Press **Enter**.


CONTROLLER TYPE aw MB (Ver: aaw) CONFIGURATION / ADMINISTRATION
MESSAGE :
OPTIONS : 3
Controller Parameters
32) Conserv Cache : 0 33) Duplex Flt sgnls: 0 34) Duplex sigs ch. 4: 0
35) Host reset delay: 0 36) Simplex no rstcon: 0
37) Queue Limit : 32
38) Hard Loop Id C0:P0 : 0x0 39) Hard Loop Id C0:P1 : 0x0
40) Hard Loop Id C1:P0 : 0x0 41) Hard Loop Id C1:P1 : 0x0
42) Controller 0 name (read only): 0 0 0 0 0 0 0 0
43) Controller 1 name (read only): 0 0 0 0 0 0 0 0
ENTER PARAMETER :
To change a parameter value -- enter the number next to the paran
To see the previous parameters -- enter p
To reset the controllers -- enter r

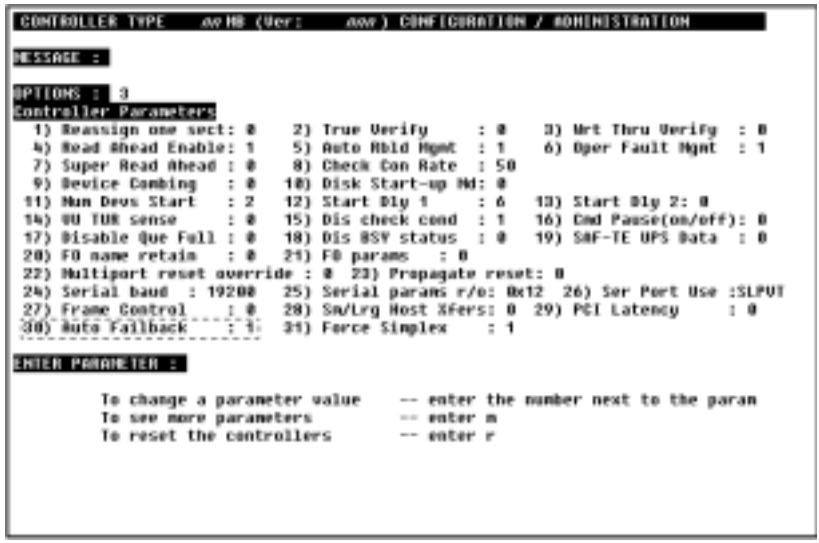
Controller Parameters, Second Screen

5. Select the controller parameter you wish to change by typing the associated number. Press **Enter**.


CONTROLLER TYPE aaMB (Ver: aaa) CONFIGURATION / ADMINISTRATION
MESSAGE :
OPTIONS : 3
Controller Parameters
1) Reassign one sec: 0 2) True Verify : 0 3) Wrt Thru Verify : 0
4) Read Ahead Enable: 1 5) Auto Rbld Mgmt : 1 6) Oper Fault Mgmt : 1
7) Super Read Ahead : 0 8) Check Con Rate : 50
9) Device Combing : 0 10) Disk Start-up Md: 0
11) Num Devs Start : 2 12) Start Dly 1 : 6 13) Start Dly 2: 0
14) BU TUR sense : 0 15) Dis check cond : 1 16) Cmd Pause(on/off): 0
17) Disable Que Full : 0 18) Dis BSY status : 0 19) SAF-TE UPS Data : 0
20) FO name retain : 0 21) FO params : 0
22) Multiport reset override : 0 23) Propagate reset: 0
24) Serial baud : 19200 25) Serial params r/o: 0x12 26) Ser Port Use :SLPUT
27) Frame Control : 0 28) Sm/Lrg Host Xfers: 0 29) PCI Latency : 0
30) Auto Failback : 0 31) Force Simplex : 1
ENTER PARAMETER :
Enter the new value for the parameter (decimal) Valid Value Range is 0 to 1

Controller Parameters, Enter New Parameter Value Screen

6. Enter the new value for the controller parameter. A range of allowable values is provided for each controller parameter. Press **Enter**.


CONTROLLER TYPE
MESSAGE :
OPTIONS : 3
Controller Parameters
1) Reassign one sect: 0
2) True Verify : 0
3) Wrt Thru Verify : 0
4) Read Ahead Enable: 1
5) Auto Rbld Mgmt : 1
6) Oper Fault Mgmt : 1
7) Super Read Ahead : 0
8) Check Con Rate : 50
9) Device Combing : 0
10) Disk Start-up Md: 0
11) Num Devs Start : 2
12) Start Dly 1 : 6
13) Start Dly 2: 0
14) OU IUR sense : 0
15) Dis check cond : 1
16) Cmd Pause(on/off): 0
17) Disable Que Full : 0
18) Dis BSY status : 0
19) SAF-TE UPS Data : 0
20) FO name retain : 0
21) FO params : 0
22) Multiport reset override : 0
23) Propagate reset: 0
24) Serial baud : 19200
25) Serial params r/o: 0x12
26) Ser Port Use :SLPVT
27) Frame Control : 0
28) SA/Lrg Host Xfers: 0
29) PCI Latency : 0
30) Auto Failback : 1
31) Force Simplex : 1
ENTER PARAMETER :
To change a parameter value -- enter the number next to the paran
To see more parameters -- enter m
To reset the controllers -- enter r

Controller Parameters, Updated Parameter Screen

7. Continue making changes until you have made all the changes necessary to the controller parameters.

> ⚠ ***Caution***
>
> Mylex recommends performing a controller reset following any parameter change. The VT100 does not prompt for this reset, but provides an option in the controller parameter screens.

8. If a controller reset is required for the controller parameter changes to take effect, type <**r**>. Press **Enter**. The controllers will reset immediately. If a controller reset is not required, press **ESC** to return to the previous menu.

> ☛**Note**
>
> Depending on the drive spin up settings, the reset function may take several minutes to complete.

After the controllers have finished resetting, the STARTUP COMPLETE message appears. Re-enter VT100 mode by typing <**@**> or the appropriate key sequence for your terminal-emulation application.

Configure, Check Drive States

The Configure, Check Drive States menu provides options for viewing, creating, and deleting a configuration. This menu also provides options for changing device states, searching for devices, and adding a logical device to an existing, configured pack. The following procedures guide you through the necessary steps to create and/or modify a configuration. The options for viewing, changing device states, searching for devices, and adding a logical device are described in Chapter 3.

Clear Configuration

If you want to create a new configuration, but another configuration already exists, you need to clear the existing configuration before creating a new configuration. To clear a configuration:

WARNING

Data on the drives is destroyed when the configuration is cleared.

1. Select Configure, Check Drive States from the Main Menu by typing **<0>**. Press **Enter**.
2. Select Clear Configuration by typing **<2>**. Press **Enter**.

WARNING

This procedure clears the entire configuration. You cannot clear only one logical device or a select group of physical drives.

3. If you are sure you want to clear this configuration, type **<y>**. Press **Enter**.

CONTROLLER TYPE
Partner: Active
MESSAGE :
OPTIONS : 2
ENTER PARAMETER :
Are you sure you want to clear the configuration? (enter y or n)

Clear Configuration Screen

If you are not sure you want to clear this configuration, type **<n>**. Press **Enter**, and return to the previous menu.

4. A prompt appears notifying you that the configuration cleared. Press any key to continue or return to the previous menu.

Clear Configuration Confirmation Screen

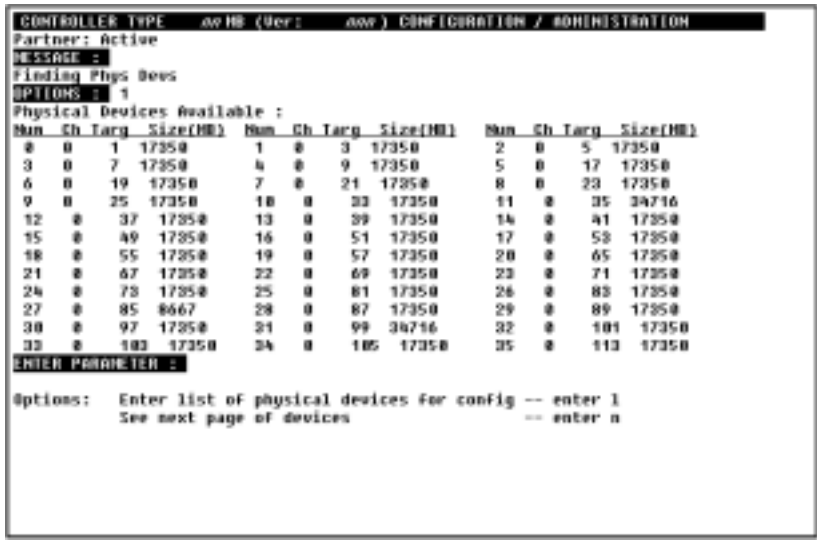
Create New Disk Packs

The Create New Disk Packs function combines selected physical devices into a device group. The device group may be divided into one or more logical devices, each with its own RAID level, write policy, and capacity. Logical devices may be created until the maximum capacity of the device group is fully used or 32 logical devices are defined.

> **☞Note**
>
> The number of physical and logical devices shown in the screen captures are an example configuration to show most of the features available on the VT100. These examples may not reflect your system or configuration.

To create a new configuration:

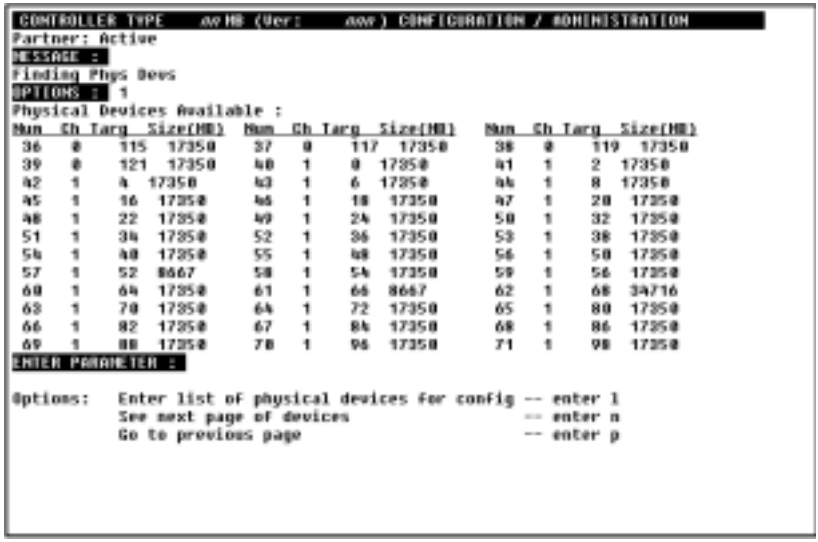
1. Select Configure, Check Drive States from the Main Menu by typing **<0>**. Press **Enter**.
2. Select Create New Disk Packs by typing **<1>**. Press **Enter**.


CONTROLLER TYPE
Partner: Active
MESSAGE :
Finding Phys Devs
OPTIONS : 1
Physical Devices Available :
ENTER PARAMETER :
Options: Enter list of physical devices for config -- enter l
See next page of devices -- enter n

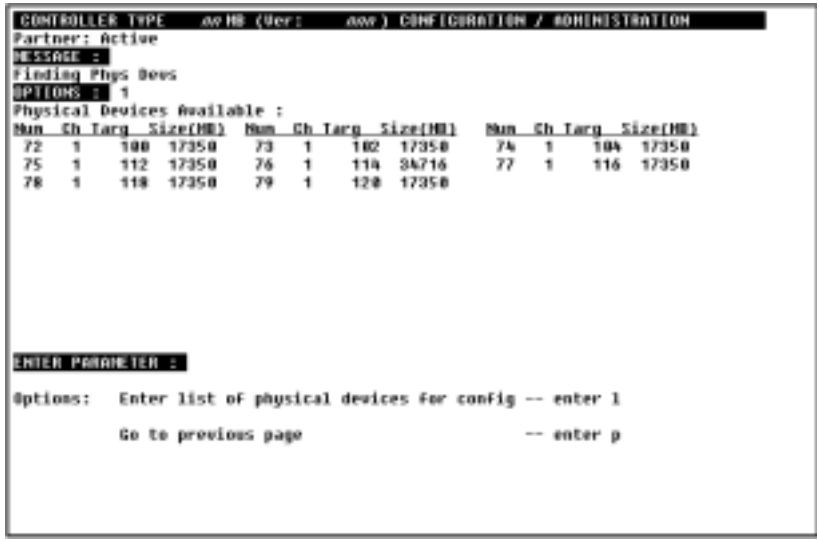
Create New Disk Packs, Available Physical Devices, First Screen

A list of available physical devices appears. This list may extend over several screens depending on the number of devices associated with this system. This information includes an arbitrary physical device number, the channel:target ID, and the physical device size (MB).

3. Navigate through the screens, by typing <**n**> for next page of devices or <**p**> for previous page. Press **Enter**.

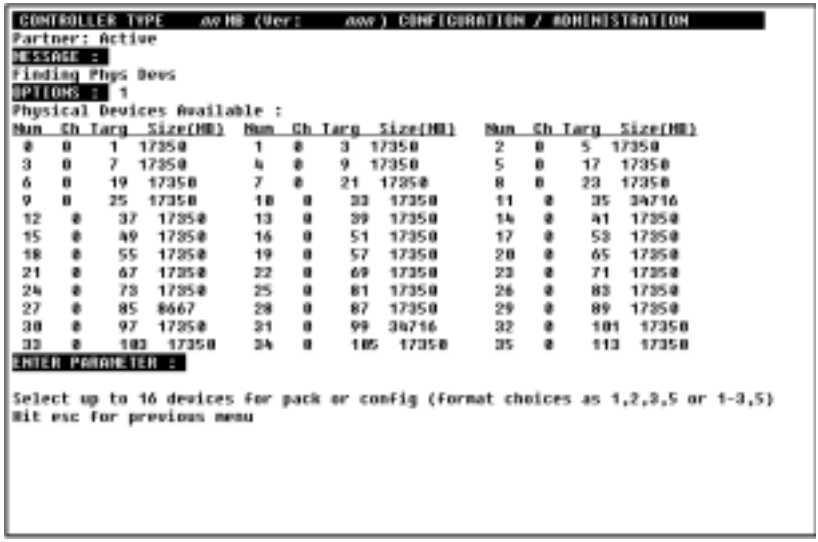


Create New Disk Packs, Available Physical Devices, Second Screen


CONTROLLER TYPE aw HB (Ver: aaw) CONFIGURATION / ADMINISTRATION
Partner: Active
MESSAGE :
Finding Phys Devs
OPTIONS : 1
Physical Devices Available :
Num Ch Targ Size(MB) Num Ch Targ Size(MB) Num Ch Targ Size(MB)
72 1 100 17350 73 1 102 17350 74 1 104 17350
75 1 112 17350 76 1 114 34716 77 1 116 17350
78 1 118 17350 79 1 120 17350
ENTER PARAMETER :
Options: Enter list of physical devices for config -- enter l
Go to previous page -- enter p

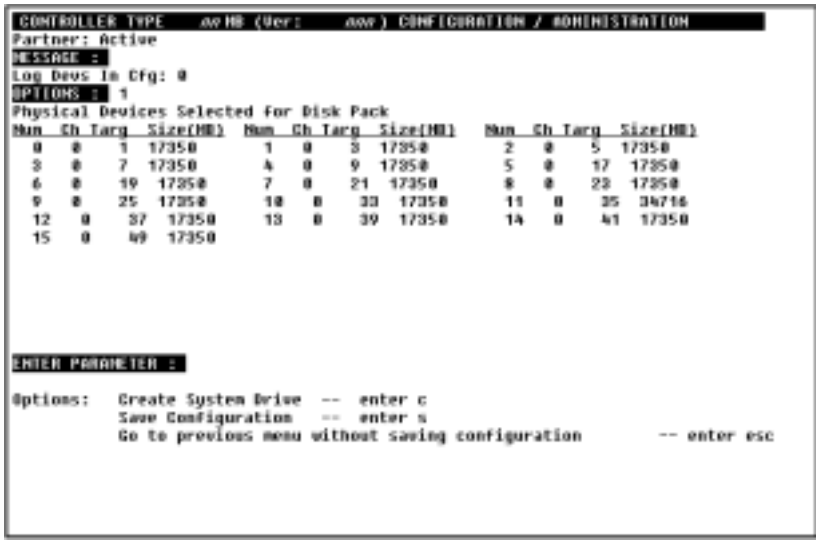
Create New Disk Packs, Available Physical Devices, Final Screen

4. Enter a list of physical devices for a new configuration by typing <**l**>. Press **Enter**.



Create New Disk Packs, Select Physical Devices Screen

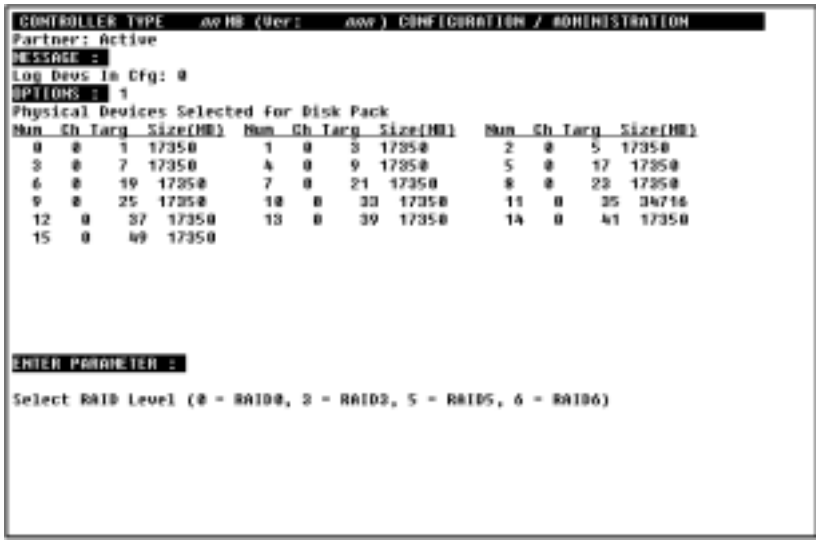
5. Select the physical devices you wish to use in your new configuration by typing the physical device number(s). You can select physical devices one at a time, separated by a comma; or you can select a range of physical devices listing the first and last devices, separated by a hyphen; or you can use a combination of both formats. Press **Enter**.


CONTROLLER TYPE aw HB (Ver: aaw) CONFIGURATION / ADMINISTRATION
Partner: Active
MESSAGE :
Log Devs In Cfg: 0
OPTIONS : 1
Physical Devices Selected for Disk Pack
Num Ch Targ Size(MB) Num Ch Targ Size(MB) Num Ch Targ Size(MB)
0 0 1 17350 1 0 3 17350 2 0 5 17350
3 0 7 17350 4 0 9 17350 5 0 17 17350
6 0 19 17350 7 0 21 17350 8 0 23 17350
9 0 25 17350 10 0 33 17350 11 0 35 34716
12 0 37 17350 13 0 39 17350 14 0 41 17350
15 0 49 17350
ENTER PARAMETER :
Options: Create System Drive -- enter c
Save Configuration -- enter s
Go to previous menu without saving configuration -- enter esc

Create New Disk Packs, Create Logical Device Screen

A list of the selected physical devices appears. This list includes the same information as above.

6. If you want to create a logical device from the physical devices shown, type **<c>**. Press **Enter**. Continue with Step 7 to create a logical device.


CONTROLLER TYPE
Partner: Active
MESSAGE :
Log Devs In Cfg: 0
OPTIONS : 1
Physical Devices Selected for Disk Pack
Num Ch Targ Size(MB) Num Ch Targ Size(MB) Num Ch Targ Size(MB)
0 0 1 17350 1 0 3 17350 2 0 5 17350
3 0 7 17350 4 0 9 17350 5 0 17 17350
6 0 19 17350 7 0 21 17350 8 0 23 17350
9 0 25 17350 10 0 33 17350 11 0 35 34716
12 0 37 17350 13 0 39 17350 14 0 41 17350
15 0 49 17350
ENTER PARAMETER :
Select RAID Level (0 = RAID0, 3 = RAID3, 5 = RAID5, 6 = RAID6)

Create New Disk Packs, Select RAID Level Screen

If you want to save the configuration, type <**s**>. Press **Enter**. Refer to Step 12 for saving the configuration.

If you do not want to create a logical device, or you want to return to the previous menu without saving the configuration, press **ESC**.

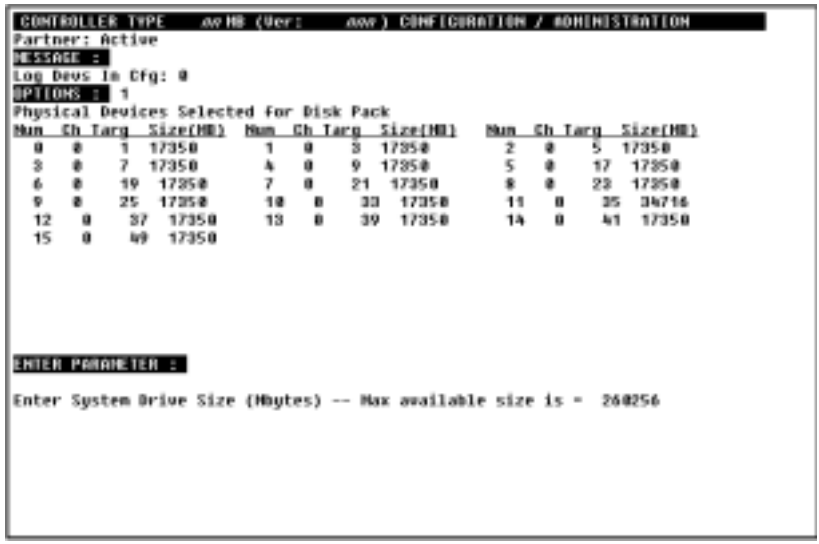
A new prompt appears at the bottom of the screen asking you to select a RAID level. A list of valid RAID levels, based on the number of physical devices selected, is given.

Mylex supported RAID levels and a short description or each are presented in Table 2-2. For more detailed information, refer to the *Encyclopedia of Controller Fundamentals and Features*, PN 775041.

Table 2-2. Mylex Supported RAID Levels

RAID Level	Description	# of Drives Min.	# of Drives Max.	Fault Tolerant
0	Block striping is provided, which yields higher performance than is possible with individual disk drives. No redundancy is provided.	2	16	No
1	Disk drives are paired and mirrored. All data is 100% duplicated on an equivalent disk drive.	2	2	Yes
3 and 5	Data is striped across several physical disk drives. Parity protection is used for data redundancy.	3	16	Yes
0+1 (Mylex RAID 6)	Combination of RAID levels 0 and 1. Data is striped across several physical disk drives. This level provides redundancy through mirroring.	4	16	Yes
JBOD (Mylex RAID 7)	"Just a Bunch of Drives." Each disk drive is operated independently like a normal disk drive; or multiple disk drives may be spanned and seen as a single large drive. This level does not provide data redundancy.	1	1	No

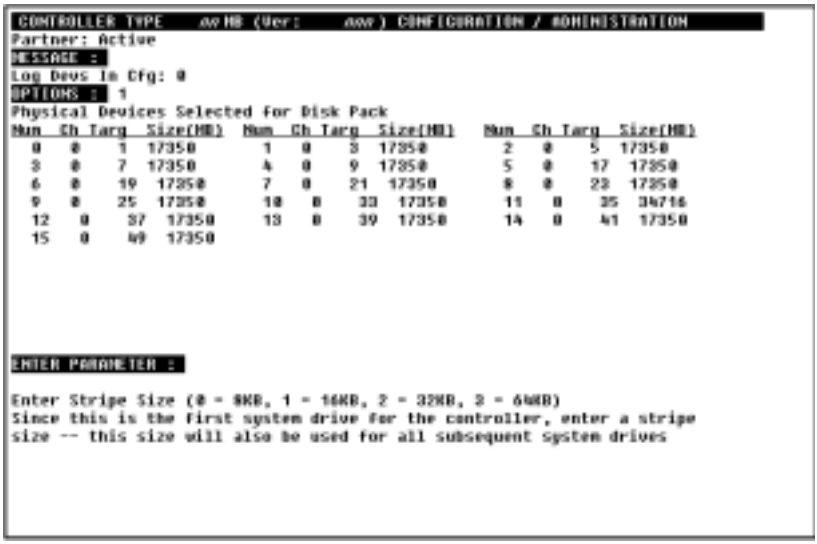
Enter the appropriate parameter for the RAID level selected. Press **Enter**.


CONTROLLER TYPE
Partner: Active
MESSAGE :
Log Devs In Cfg: 0
OPTIONS : 1
Physical Devices Selected for Disk Pack
Num Ch Targ Size(MB) Num Ch Targ Size(MB) Num Ch Targ Size(MB)
0 0 1 17350 1 0 3 17350 2 0 5 17350
3 0 7 17350 4 0 9 17350 5 0 17 17350
6 0 19 17350 7 0 21 17350 8 0 23 17350
9 0 25 17350 10 0 33 17350 11 0 35 34716
12 0 37 17350 13 0 39 17350 14 0 41 17350
15 0 49 17350
ENTER PARAMETER :
Enter System Drive Size (MBytes) -- Max available size is = 260256

Create New Disk Packs, Enter Logical Device Size (MB) Screen

A new prompt appears at the bottom of the screen asking you to enter a logical device size (in MB).

7. Enter the drive (device) size (in MB). Press **Enter**.


CONTROLLER TYPE aa MB (Ver: aaa) CONFIGURATION / ADMINISTRATION
Partner: Active
MESSAGE :
Log Devs In Cfg: 0
OPTIONS : 1
Physical Devices Selected For Disk Pack
Num Ch Targ Size(MB) Num Ch Targ Size(MB) Num Ch Targ Size(MB)
0 0 1 17350 1 0 3 17350 2 0 5 17350
3 0 7 17350 4 0 9 17350 5 0 17 17350
6 0 19 17350 7 0 21 17350 8 0 23 17350
9 0 25 17350 10 0 33 17350 11 0 35 34716
12 0 37 17350 13 0 39 17350 14 0 41 17350
15 0 49 17350
ENTER PARAMETER :
Enter Stripe Size (0 = 8KB, 1 = 16KB, 2 = 32KB, 3 = 64KB)
Since this is the first system drive for the controller, enter a stripe
size -- this size will also be used for all subsequent system drives

Create New Disk Packs, Enter Stripe Size Screen

A new prompt appears at the bottom of the screen asking you to enter a stripe size. The parameters for the possible stripe sizes are given. You are prompted to select a stripe size for the first logical device created. All other logical devices and configurations assume this stripe size.

8. Enter the appropriate parameter for the stripe size selected. Press **Enter**.

CONTROLLER TYPE aw MB (Ver: aaw) CONFIGURATION / ADMINISTRATION
Partner: Active
MESSAGE :
Log Devs In Cfg: 0
OPTIONS : 1
Logical Device Selections
Num Ch Targ Size(MB) Num Ch Targ Size(MB) Num Ch Targ Size(MB)
0 0 1 17350 1 0 3 17350 2 0 5 17350
3 0 7 17350 4 0 9 17350 5 0 17 17350
6 0 19 17350 7 0 21 17350 8 0 23 17350
9 0 25 17350 10 0 33 17350 11 0 35 34716
12 0 37 17350 13 0 39 17350 14 0 41 17350
15 0 49 17350
ENTER PARAMETER : 1
Select Write-Thru or Write-Back (0 = Write-Thru, 1 = Write-Back)

Create New Disk Packs, Select Write Policy Screen

A new prompt appears at the bottom of the screen asking you to select the write policy for the logical device. The write policy determines the caching strategy for write operations. Write-Through writes data to the device before returning completion status to the host. Write-Back returns a completion status to the host as soon as the cache receives the data. The target device receives the data at a more appropriate time. For more detailed information, refer to the *Encyclopedia of Controller Fundamentals and Features*, PN 775041.

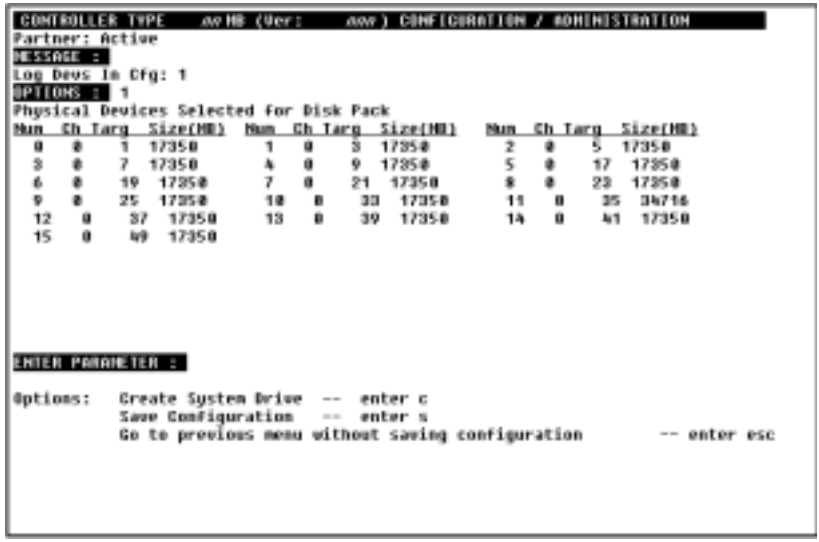
9. Enter the appropriate parameter for the write policy selected. Press **Enter**.

CONTROLLER TYPE aw MB (Ver: aw) CONFIGURATION / ADMINISTRATION
Partner: Active
MESSAGE :
Log Devs In Cfg: 0
OPTIONS : 1
Logical Device Selections
Log Dev Number : 0 Raid Level : 5 Log Dev State : 1
Log Dev Size (MB) : 495 Stripe Size (KB) : 64 Phys Devs Used: 16
Wrt Back--Wrt Thru: Back
ENTER PARAMETER :
Are these selections correct? (y for yes, n for no)

Create New Disk Packs, Save Selections Screen

10. If these selections are correct, type **<y>** and continue to Step 11 to create more logical devices, or Step 12 to save the configuration. Press **Enter**.

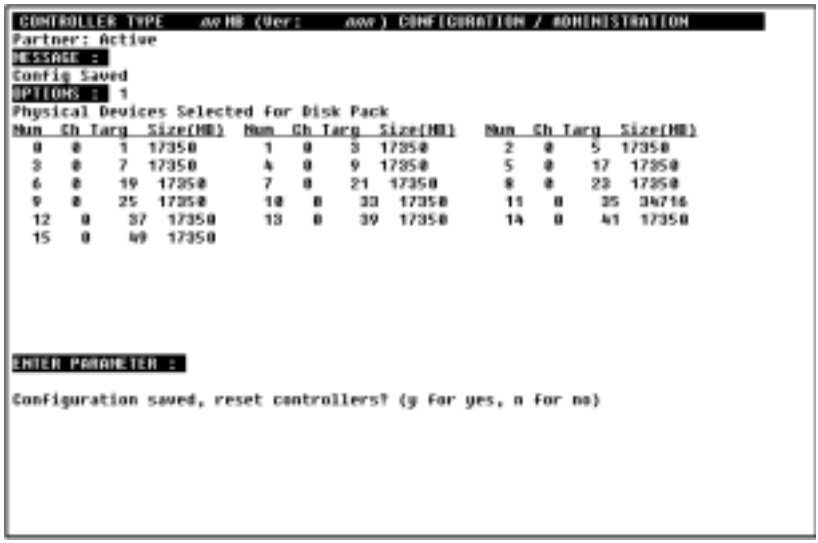
If these selections are not correct, type **<n>** to return to Step 6 to create a new logical device with different characteristics. Press **Enter**.


CONTROLLER TYPE aw HB (Ver: aaw) CONFIGURATION / ADMINISTRATION
Partner: Active
MESSAGE :
Log Devs In Cfg: 1
OPTIONS : 1
Physical Devices Selected for Disk Pack
Num Ch Targ Size(MB) Num Ch Targ Size(MB) Num Ch Targ Size(MB)
0 0 1 17350 1 0 3 17350 2 0 5 17350
3 0 7 17350 4 0 9 17350 5 0 17 17350
6 0 19 17350 7 0 21 17350 8 0 23 17350
9 0 25 17350 10 0 33 17350 11 0 35 34716
12 0 37 17350 13 0 39 17350 14 0 41 17350
15 0 49 17350
ENTER PARAMETER :
Options: Create System Drive -- enter c
Save Configuration -- enter s
Go to previous menu without saving configuration -- enter esc

Create New Disk Packs, Create Another Logical Device or Save Screen

11. To create more logical devices from the same group of physical devices, type **<c>**, press **Enter**, and return to Step 6. Perform Step 6 through Step 10 (skipping Step 8 for all subsequent logical devices) for each logical device you wish to create.

12. To save the final, completed, configuration type **<s>**. Press **Enter**. This saves the configuration immediately.


CONTROLLER TYPE
Partner: Active
MESSAGE :
Config Saved
OPTIONS : 1
Physical Devices Selected for Disk Pack
Num Ch Targ Size(MB) Num Ch Targ Size(MB) Num Ch Targ Size(MB)
0 0 1 17350 1 0 3 17350 2 0 5 17350
3 0 7 17350 4 0 9 17350 5 0 17 17350
6 0 19 17350 7 0 21 17350 8 0 23 17350
9 0 25 17350 10 0 33 17350 11 0 35 34716
12 0 37 17350 13 0 39 17350 14 0 41 17350
15 0 49 17350
ENTER PARAMETER :
Configuration saved, reset controllers? (y for yes, n for no)

Create New Disk Packs, Reset Controllers Screen

A prompt appears notifying the user that the configuration is saved, and asking the user to reset the controllers.

13. To reset the controllers, type **<y>**. Press **Enter**. The controllers will reset immediately after pressing Enter.

> **☛Note**
>
> Depending on the drive spin up settings, the reset function may take several minutes to complete.

14. After the controllers have finished resetting, the STARTUP COMPLETE message appears. Re-enter VT100 mode by typing <**@**> or the appropriate key sequence for your terminal-emulation application.

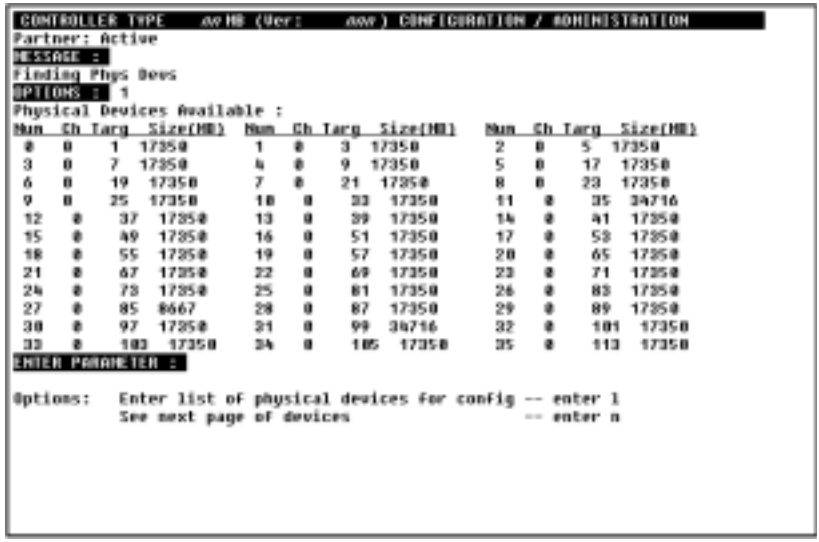
Create an Online Spare

The Create New Disk Packs function also allows the user to create an online spare to be used during the rebuild process when another physical device fails.

> **☛Note**
>
> The number of physical and logical devices shown in the screen captures are an example configuration to show most of the features available on the VT100. These examples may not reflect your system or configuration.

To create an online spare device:

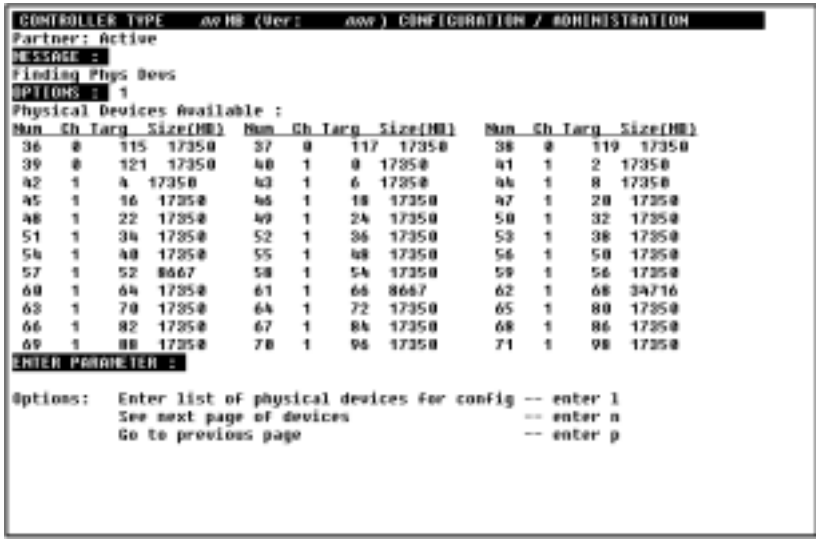
1. Select Configure, Check Drive States from the Main Menu by typing **<0>**. Press **Enter**.
2. Select Create New Disk Packs by typing **<1>**. Press **Enter**.



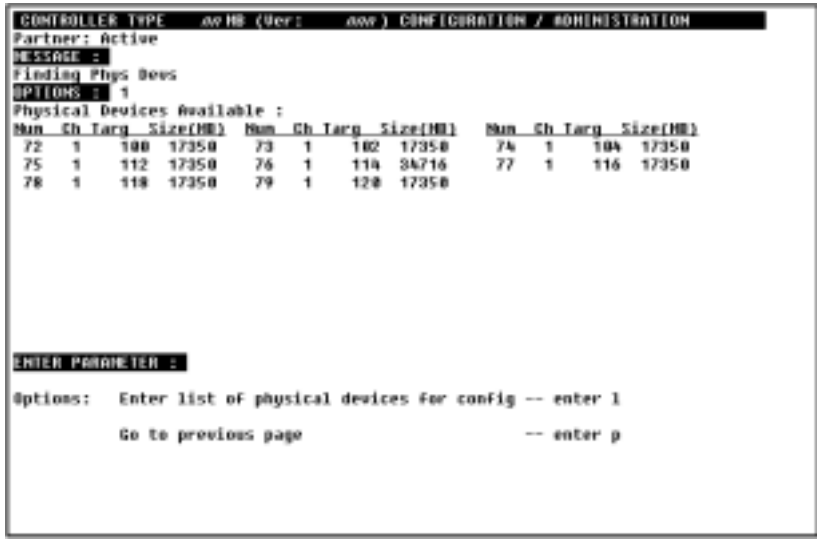
Create New Disk Packs, Available Physical Devices, First Screen

A list of available physical devices appears. This list may extend over several screens depending on the number of devices associated with this system. This information includes an arbitrary physical device number, the channel:target ID, and the physical device size (MB).

3. Navigate through the screens, by typing <**n**> for next page of devices or <**p**> for previous page. Press **Enter**.



Create New Disk Packs, Available Physical Devices, Second Screen


CONTROLLER TYPE aw MB (Ver: aaw) CONFIGURATION / ADMINISTRATION
Partner: Active
MESSAGE :
Finding Phys Devs
OPTIONS : 1
Physical Devices Available :
Num Ch Targ Size(MB) Num Ch Targ Size(MB) Num Ch Targ Size(MB)
72 1 100 17350 73 1 102 17350 74 1 104 17350
75 1 112 17350 76 1 114 34716 77 1 116 17350
78 1 118 17350 79 1 120 17350
ENTER PARAMETER :
Options: Enter list of physical devices for config -- enter l
Go to previous page -- enter p

Create New Disk Packs, Available Physical Devices, Final Screen

4. Select only one physical device to be configured as an online spare by typing the appropriate device number. Press **Enter**.

CONTROLLER TYPE
CONFIGURATION / ADMINISTRATION
MESSAGE :
Log Devs In Cfg: 0
OPTIONS : 1
Physical Devices Selected For Disk Pack
Num Ch Targ Size(MB)
Num Ch Targ Size(MB)
Num Ch Targ Size(MB)
0 0 1 17186
ENTER PARAMETER :
Options: Create System Drive -- enter c
Make online spare -- enter a
Go to previous menu without saving configuration -- enter esc

Create Online Spare, Select Option Screen

5. If you want to create a logical device (system drive) from the selected physical device shown, type <**c**>. Press **Enter**. Return to Step 7 on page 2-21 to create a logical device.

   If you do not want to create a logical device or an online spare, or you want to return to the previous menu without saving the configuration, press **ESC**.

6. If you want to make the selected device an online spare, type <**o**>. Press **Enter**.

CONTROLLER TYPE
MESSAGE :
Config Saved
OPTIONS : 1
Physical Devices Selected for Disk Pack
Num Ch Targ Size(MB)
Num Ch Targ Size(MB)
Num Ch Targ Size(MB)
0 0 1 17186
ENTER PARAMETER :
Configuration saved, reset controllers? (y for yes, n for no)

Create Online Spare, Reset Controllers Screen

A prompt appears notifying the user that the device (configuration) is saved as an online spare, and asking the user to reset the controllers.

7. To reset the controllers, type **<y>**. Press **Enter**. The controllers will reset immediately after pressing Enter.

> ☛**Note**
>
> Depending on the drive spin up settings, the reset function may take several minutes to complete.

8. After the controllers have finished resetting, the STARTUP COMPLETE message appears. Re-enter VT100 mode by typing <**@**> or the appropriate key sequence for your terminal-emulation application.

SANmapping™

SANmapping allows the user to determine complex LUN assignments. SANmapping determines whether a logical device is accessible via one or both host ports on a single controller, or accessible via all host ports on all controllers in a dual-active controller system. SANmapping also determines which host(s) has access to a specific logical device in a multi-host, or SAN (Storage Area Network) environment.

> **☛Note**
>
> The number of physical and logical devices shown in the screen captures are an example configuration to show most of the features available on the VT100. These examples may not reflect your system or configuration.

To view, alter or save SANmapping information:

1. Select SANmapping from the Main Menu by typing <**1**>. Press **Enter**.

CONTROLLER TYPE
Partner: Active
MESSAGE :
OPTIONS : 1
ENTER PARAMETER :
Enter Controller Port Combination (0 = C0P0, 1 = C0P1, 2 = C1P0, 3 = C1P1)

SANmapping, Enter Controller/Host Port Combination Screen

2. Select the controller/host port combination for which SANmapping is to be changed.

CONTROLLER TYPE aaMB (Ver: aaa) CONFIGURATION / ADMINISTRATION
Partner: Active
MESSAGE :
Controller 0 Port 0
OPTIONS : 1
SAN Mapping Data -- LUN, System Drive Information
System Drives
0 1 2 3 4 5 6 7 8 9 10111213141516171819202122232425262728293031
SDs defined x x x x x x x x x x x x x x x x
LUN Number 0 1 2 3 4 5 6 7 8 9 10111213141516171819202122232425262728293031
VisibleT Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
All Hosts Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
Enabled?
ENTER PARAMETER :
Options: Alter System Drive Information -- enter a
View Host to System Drive Map -- enter v
Save SAN Mapping Information -- enter s

SANmapping, Enter SANmapping Action Screen

A LUN, System Drive Information table appears showing the current system drive information including which system drives have been defined, the LUN number, whether this system drive is visible through this controller/host port combination, and whether this system drive is accessible to all hosts.

3. To alter the current LUN, System Drive Information, type <**a**>. Press **Enter**. Refer to Step 4 for instructions on how to alter the current LUN, System Drive Information.

SANmapping, Enter System Drive Screen

To View the Host to System Drive Map, type <**v**>. Press **Enter**. Refer to Step 8 for instructions on how to view the current Host to System Drive Table.

To save the current SANmapping Information, type <**s**>. Press **Enter**. Refer to Step 14 for instructions on how to save the current SANmapping information.

4. Enter the System Drive Number for which the SANmapping is to be altered. Press **Enter**.

CONTROLLER TYPE aaMB (Ver: aaa) CONFIGURATION / ADMINISTRATION
Partner: Active
MESSAGE :
Controller 0 Port 0
OPTIONS : 1
SAN Mapping Data -- LUN, System Drive Information
System Drives
0 1 2 3 4 5 6 7 8 9 10111213141516171819202122232425262728293031
SDs defined x x x x x x x x x x x x x x x x
LUN Number 0 1 2 3 4 5 6 7 8 9 10111213141516171819202122232425262728293031
VisibleT Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
All Hosts Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
Enabled?
ENTER PARAMETER : 2
Enter LUN number For this System Drive (enter n For no LUN number)

SANmapping, Enter LUN Number Screen

5. Enter the LUN Number for this system drive. Press **Enter**.

6. Set the Visibility for this system drive. Press **Enter**.

SANmapping, Enter Visibility Screen

If you select <**n**> or no for the visibility, you are returned to Step 3 to make further changes, View the Host to System Drive Map or to Save the SANmapping Information.

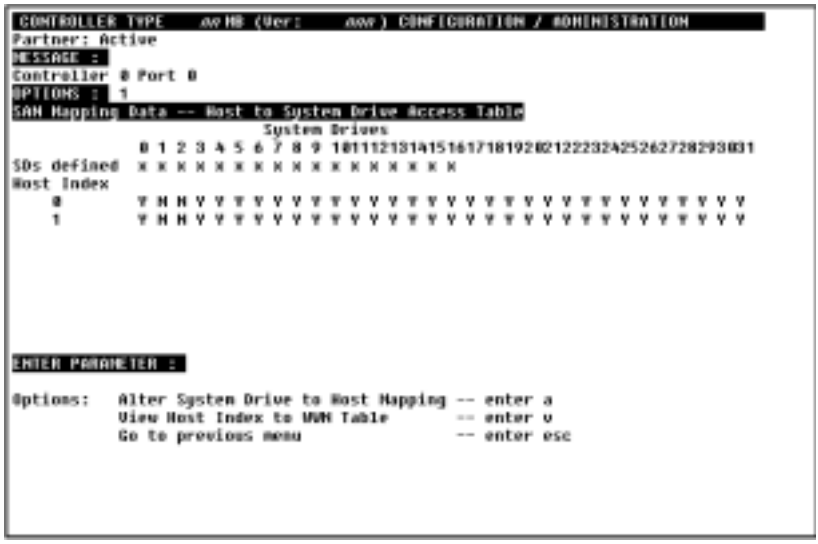
CONTROLLER TYPE aaMB (Ver: aaa) CONFIGURATION / ADMINISTRATION
Partner: Active
MESSAGE :
Controller 0 Port 0
OPTIONS : 1
SAN Mapping Data -- LUN, System Drive Information
System Drives
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
SDs defined X X X X X X X X X X X X X X X X
LUN Number 0 2 1 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
VisibleT Y N Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
All Hosts Y N Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
Enabled?
ENTER PARAMETER :
Options: Alter System Drive Information -- enter a
View Host to System Drive Map -- enter v
Save SAN Mapping Information -- enter s

SANmapping, Set All Host Access Screen

7. Select whether this system drive has accessibility to all hosts. Press **Enter**.

   Continue making LUN mapping changes to other system drives as necessary. After you are finished, either View the Host to System Drive Map or Save the SANmapping Information.

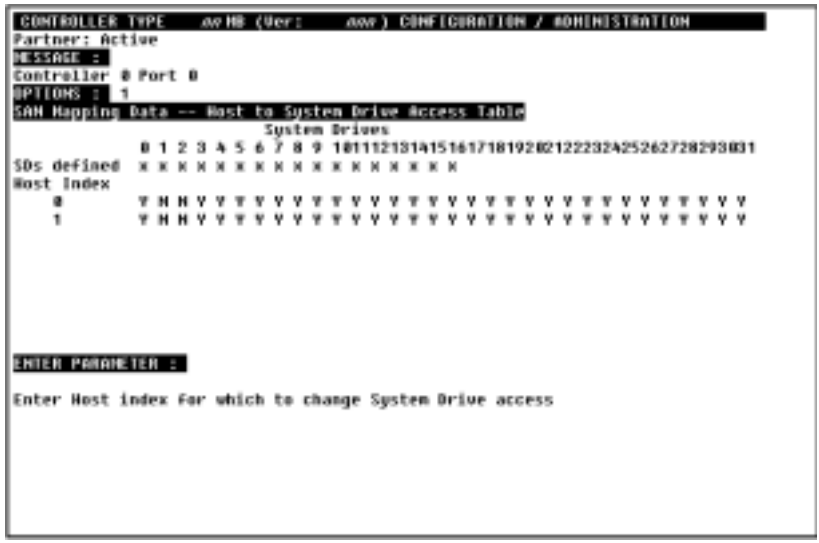
8. View the Host to System Drive Map by typing <**v**>. Press **Enter**.


CONTROLLER TYPE
Partner: Active
MESSAGE :
Controller 0 Port 0
OPTIONS : 1
SAN Mapping Data -- Host to System Drive Access Table
System Drives
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
SDs defined X X X X X X X X X X X X X X X X
Host Index
0 Y N N Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
1 Y N N Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
ENTER PARAMETER :
Options: Alter System Drive to Host Mapping -- enter a
View Host Index to WWN Table -- enter v
Go to previous menu -- enter esc

SANmapping, View Host to System Drive Access Table

9. To alter the System Drive to Host Mapping, type <**a**>. Press **Enter**. Refer to Step 10 for instructions to alter the System Drive to Host Mapping.

The controllers are capable of supporting up to 64 host initiators, however, the VT100 currently only supports up to 8 hosts.

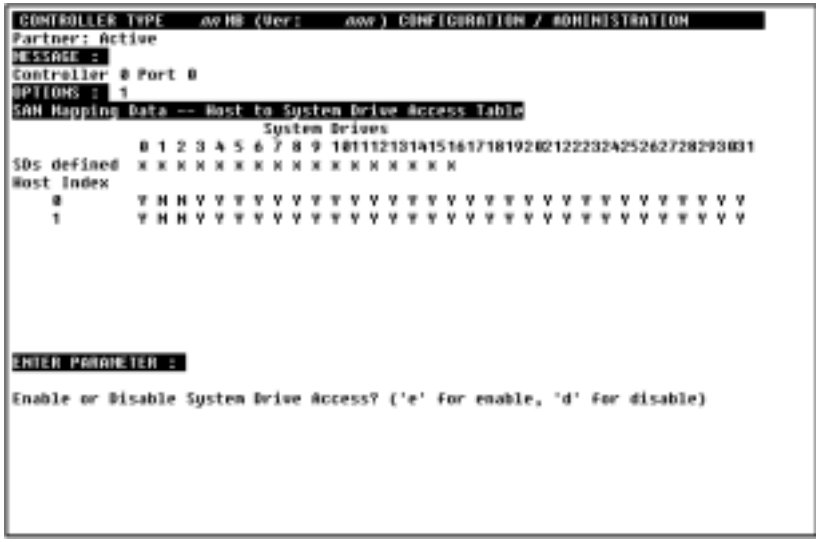

CONTROLLER TYPE aaMB (Ver: aaa) CONFIGURATION / ADMINISTRATION
Partner: Active
MESSAGE :
Controller 0 Port 0
OPTIONS : 1
SAN Mapping Data -- Host to System Drive Access Table
System Drives
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
SDs defined x x x x x x x x x x x x x x x x
Host Index
0 Y N N Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
1 Y N N Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
ENTER PARAMETER :
Enter Host index for which to change System Drive access

SANmapping, Enter Host Index Screen

To View the Host Index to WWN Table, type <**v**>. Press **Enter**. Refer to Step 16 for instructions to View the Host Index to WWN Table.

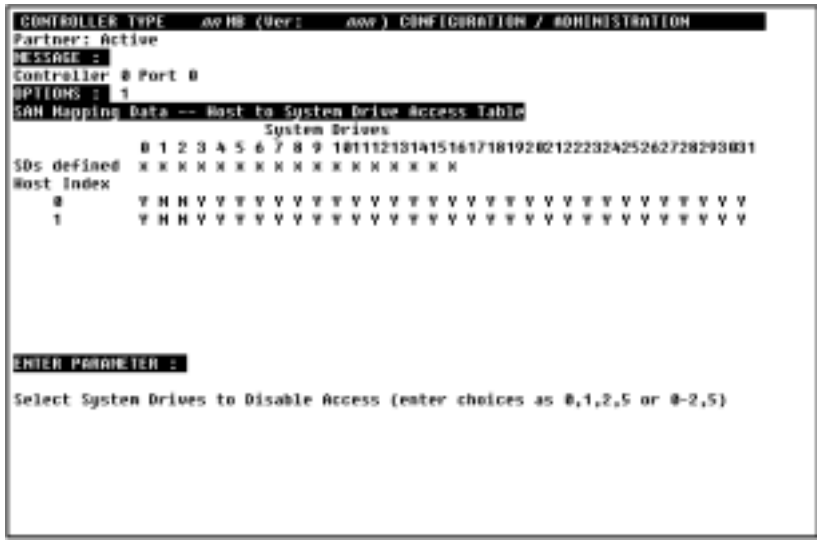
To return to the previous menu, press **ESC**.

10. Enter the Host index for which system drive access is to be changed. Press **Enter**.


CONTROLLER TYPE aw HB (Ver: aaw) CONFIGURATION / ADMINISTRATION
Partner: Active
MESSAGE :
Controller 0 Port 0
OPTIONS : 1
SAN Mapping Data -- Host to System Drive Access Table
System Drives
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
SDs defined X X X X X X X X X X X X X X X X
Host Index
0 Y N N Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
1 Y N N Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
ENTER PARAMETER :
Enable or Disable System Drive Access? ('e' for enable, 'd' for disable)

SANmapping, Enable or Disable System Drive Access Screen

11. Enable or Disable the system drive access. Press **Enter**.


CONTROLLER TYPE aw HB (Ver: aaw) CONFIGURATION / ADMINISTRATION
Partner: Active
MESSAGE :
Controller 0 Port 0
OPTIONS : 1
SAN Mapping Data -- Host to System Drive Access Table
System Drives
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
SDs defined X X X X X X X X X X X X X X X X
Host Index
0 Y N N Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
1 Y N N Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
ENTER PARAMETER :
Select System Drives to Disable Access (enter choices as 0,1,2,5 or 0-2,5)

SANmapping, Select System Drive Screen

12. Select system drive(s) for which access status changes. Press **Enter**.

13. Press **ESC** to return to the previous menu.

CONTROLLER TYPE aw MB (Ver: aaw) CONFIGURATION / ADMINISTRATION
Partner: Active
MESSAGE :
Controller 0 Port 0
OPTIONS : 1
SAN Mapping Data -- LUN, System Drive Information
System Drives
0 1 2 3 4 5 6 7 8 9 10111213141516171819202122232425262728293031
SDs defined x x x x x x x x x x x x x x x x
LUN Number 0 1 2 3 4 5 6 7 8 9 10111213141516171819202122232425262728293031
Visible? Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
All Hosts Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
Enabled?
ENTER PARAMETER :
Options: Alter System Drive Information -- enter a
View Host to System Drive Map -- enter v
Save SAN Mapping Information -- enter s

SANmapping, Enter SANmapping Action Screen

14. To save SANmapping information, type <**s**>. Press **Enter**.
15. Press **ESC** to return to the previous menu.

The View Host Index to WWN Table includes the Host Index number, the Host WWN identifier, and the controller/host port connections associated with that host. This table is recreated every time the configuration is cleared.

SANmapping, Host Index to WWN Table Screen

16. After viewing the Host Index to WWN table, press **ESC** to return to the previous menu.

Initialize Logical Devices

Mylex recommends initializing the new logical devices, or system drives, before using. The initialization process aligns the drives and sets the parity on RAID 3 and 5 arrays.

WARNING

Failure to initialize a newly created or modified logical device can result in loss of data.

Note

Dual-active only. The logical device must be initialized from the controller to which it has been assigned.

Start Foreground Initialization

Note

The number of physical and logical devices shown in the screen captures are an example configuration to show most of the features available on the VT100. These examples may not reflect your system or configuration.

To perform an initialization:

1. Select Start or Stop Long Ops from the Main Menu by typing **<3>**. Press **Enter**.

2. Select Start Foreground Initialization by typing **<0>**. Press **Enter**.

Start Foreground Initialization, Enter System Drive Screen

3. Enter the System Drive number that you would like to initialize. Press **Enter**.

Start Foreground Initialization, Successfully Started Screen

WARNING

Selecting Yes immediately begins the initialization function. Initializing the wrong system drives results in data loss.

The foreground initialization starts immediately. The option prompt indicates that the initialization has started successfully. The message line provides a progressive report on the percentage of initialization that has completed.

4. Press any key to continue. Select additional system drives for initialization as described in Step 3.

The message line indicates when the initialization has completed.

Start Foreground Initialization, Completed Screen

5. Press any key to return to the Start or Stop Long Ops menu.

Stop Foreground Initialization

To stop a foreground initialization that is in progress:

1. From the Start or Stop Long Ops menu, select Stop Foreground Initialization by typing <**1**>. Press **Enter**.

Start Foreground Initialization, Stopped Screen

The foreground initialization stops immediately.

2. Press any key to return to the Start or Stop Long Ops menu.

Chapter 3
Array Management and Configuration Editing

This chapter guides the user through the administrative, managing, and editing features of the Mylex controllers. The chapter follows the menu structure, describing each menu item. Items described in Chapter 2 are briefly described and reference to the appropriate location.

Configure, Check Drive States

The Configure, Check Drive States menu provides options for viewing, creating, and deleting a configuration. This menu also provides options for changing device states, searching for devices, and adding a logical device to an existing, configured pack.

View Current Configuration

Whether you are creating a new configuration or modifying an existing configuration, viewing the current configuration provides the user with useful information. Viewing the current configuration provides information about physical devices and logical devices used in the configuration.

> **☞Note**
>
> The number of physical and logical devices shown in the screen captures are an example configuration to show most of the features available on the VT100. These examples may not reflect your system or configuration.

To view the current configuration:

1. Select Configure, Check Drives States from the Main Menu by typing **<0>**. Press **Enter**.
2. Select View Current Configuration by typing **<0>**. Press **Enter**.

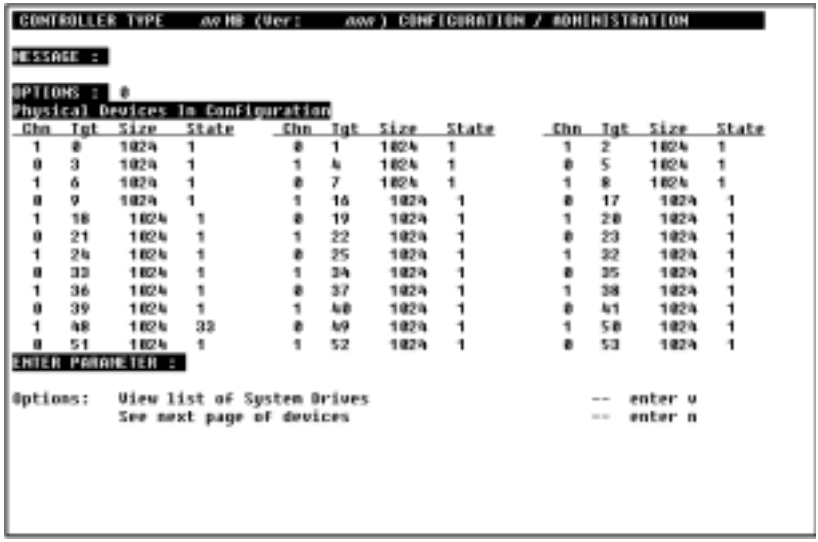
If no configuration is available, the following message appears.

CONTROLLER TYPE
MB (Ver:
) CONFIGURATION / ADMINISTRATION
MESSAGE :
OPTIONS : 0
0. View Current Configuration
1. Create New Disk Packs
2. Clear Configuration
3. Show Drives, Change Drive State
4. Search For Physical Devices
5. Add Logical Drive to Existing Physical Device Packs
ENTER PARAMETER :
No configuration available
Press any key to continue

View Configuration, No Configuration Available Screen

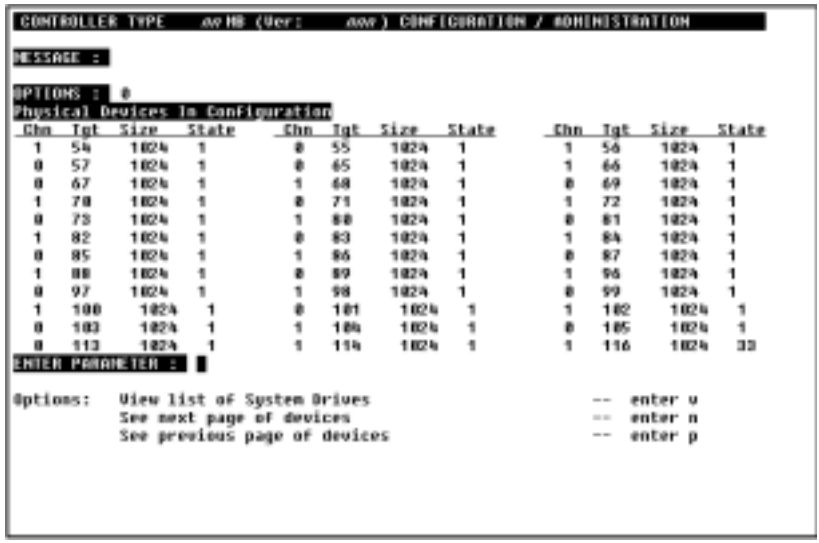
If a configuration exists, a list of physical devices used in the current configuration appears. This list may extend over several screens depending on the number of devices associated with this system. This information includes channel:target IDs, device size (MB) and the

device state. Refer to “Show Drives, Change Drive State” on page 3-14 for more information on device states.

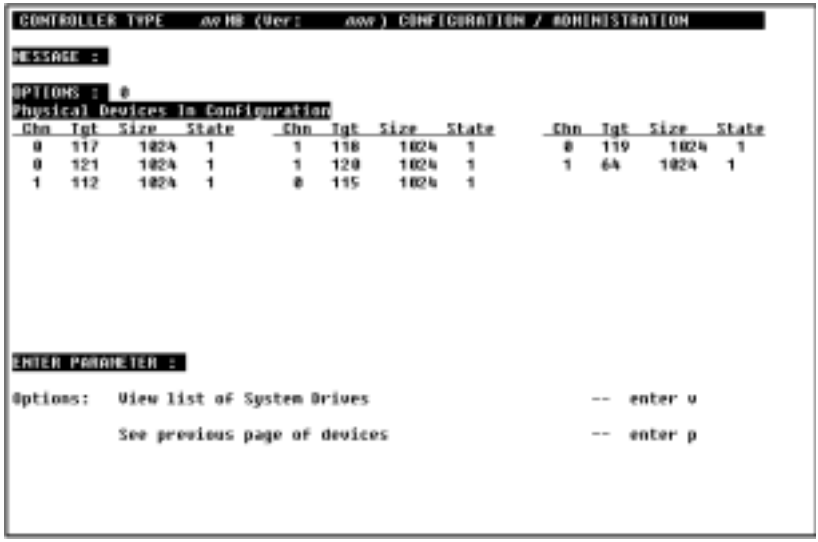


View Configuration, Physical Devices in Configuration, First Screen

3. Navigate through the screens, by typing <**n**> for next page of devices or <**p**> for previous page. Press **Enter**.

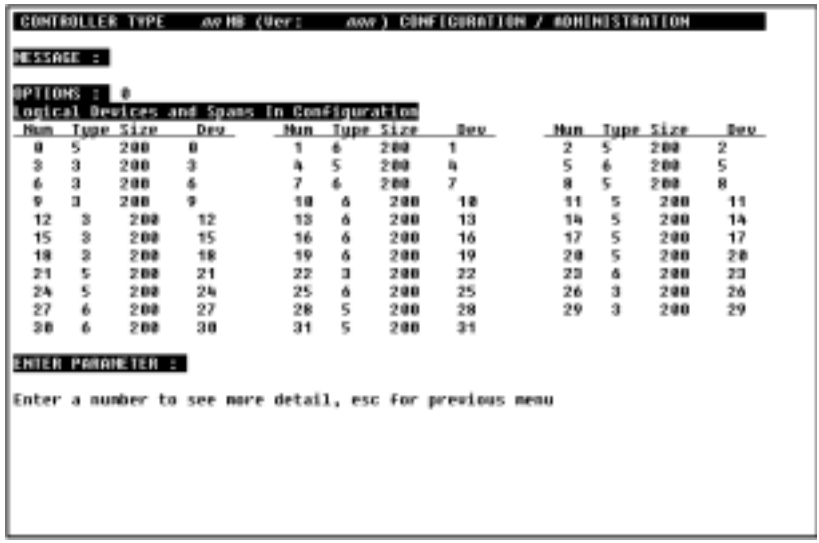


View Configuration, Physical Devices in Configuration, Second Screen


CONTROLLER TYPE AMI MB (Ver: AMI) CONFIGURATION / ADMINISTRATION
MESSAGE :
OPTIONS : 0
Physical Devices In Configuration
Chn Tgt Size State Chn Tgt Size State Chn Tgt Size State
0 117 1024 1 1 118 1024 1 0 119 1024 1
0 121 1024 1 1 120 1024 1 1 64 1024 1
1 112 1024 1 0 115 1024 1
ENTER PARAMETER :
Options: View list of System Drives -- enter v
See previous page of devices -- enter p

View Configuration, Physical Devices in Configuration, Final Screen

4. View the system drives associated with the physical devices in the configuration by typing **<v>**. Press **Enter**.

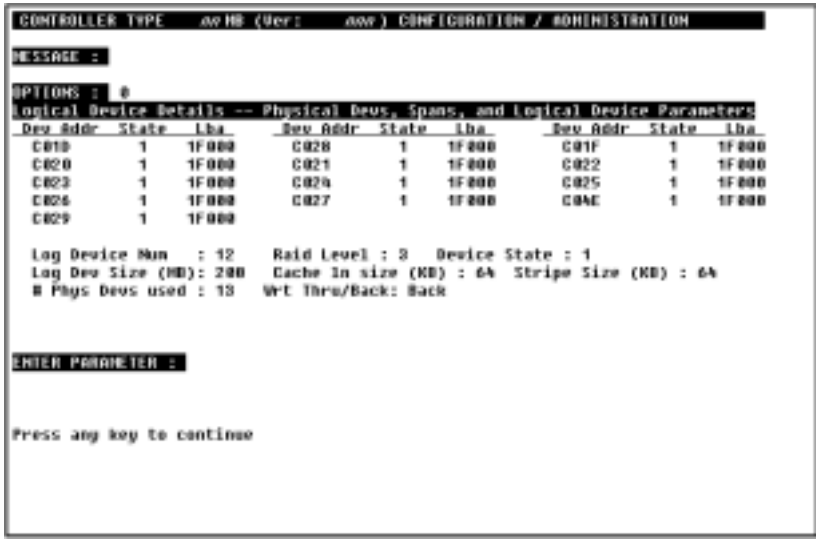


View Configuration, Logical Devices in Configuration Screen

A list of logical devices created from the previously displayed physical devices appears. This information includes logical device number (arbitrarily set for VT100 selection purposes), RAID type, virtual size (MB), and RAID device number. The RAID device number is assigned by the firmware and is related to the RAID device type. For more information on RAID devices, refer to the *Firmware/Software Interface Reference Manual, PN 775067.*

To view spanned logical devices, skip to Step 8.

5. View more detailed information on individual logical devices by typing any displayed logical device number. Press **Enter**.


CONTROLLER TYPE aw MB (Ver: aw) CONFIGURATION / ADMINISTRATION
MESSAGE :
OPTIONS : 0
Logical Device Details -- Physical Devs, Spans, and Logical Device Parameters
Dev Addr State Lba Dev Addr State Lba Dev Addr State Lba
C010 1 1F000 C020 1 1F000 C01F 1 1F000
C020 1 1F000 C021 1 1F000 C022 1 1F000
C023 1 1F000 C024 1 1F000 C025 1 1F000
C026 1 1F000 C027 1 1F000 C04E 1 1F000
C029 1 1F000
Log Device Num : 12 Raid Level : 3 Device State : 1
Log Dev Size (MB): 200 Cache In size (KB) : 64 Stripe Size (KB) : 64
Phys Devs used : 13 Wrt Thru/Back: Back
ENTER PARAMETER :
Press any key to continue

View Configuration, Logical Device Details Screen

A list of details concerning the specific logical device chosen appears. This lists includes a table of physical device information, including:

- Device Address—This is a RAID device number randomly assigned to the physical devices that make up this logical device. For more information on RAID devices, refer to the *Firmware/Software Interface Reference Manual, PN 775067*.
- Device State—This represents the physical device state. Refer to “Show Drives, Change Drive State” on page 3-14 for more information.
- Lba—This represents the logical block address of the physical device where the logical device begins.

This list also includes information on the logical device, including:

- Logical Device Number—This is the randomly assigned RAID device number associated with this device.

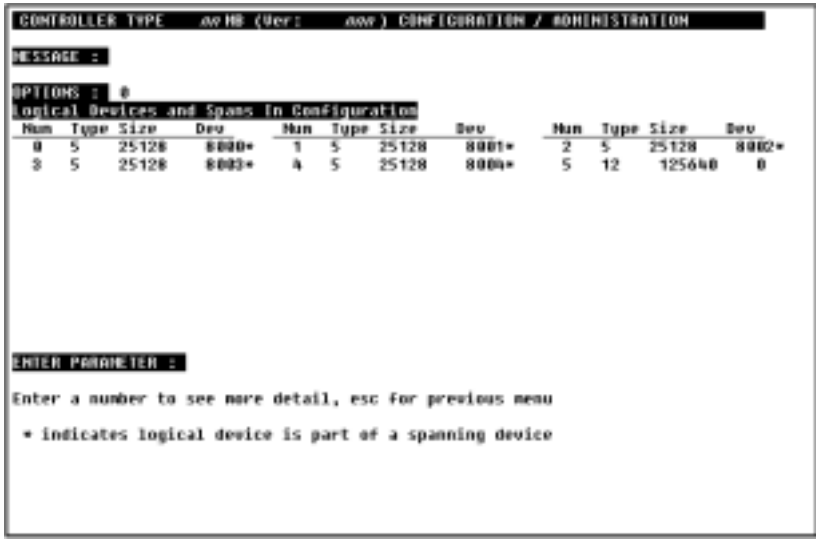
- RAID Level—This represents a valid RAID level.
- Device State—This represents the logical device state. Refer to “Show Drives, Change Drive State” on page 3-14 for more information.
- Logical Device Size—This is the size, in MB, assigned to this device during the create configuration process.
- Cache Line Size—This represents the size of the data “chunk” that will be read or written at one time and is based on the stripe size.
- Stripe Size—This is the stripe size assigned to the configuration during the create configuration process.
- Number of Physical Devices Used—This is the number of physical devices assigned to this logical device.
- Write Policy—This indicates whether write-through or write-back caching is used for writing data to disk.

6. Return to the list of logical devices by pressing any key.

   Repeat Step 5 for detailed information on other logical devices.

7. Press **ESC** to return to the previous screen, or press **ESC** again to return to Configure, Check Drive State menu.

8. If spanned system drives exist in the configuration, the logical devices and spans are viewed by typing <**v**>. Press **Enter**.


CONTROLLER TYPE AMI MB (Ver: AMI) CONFIGURATION / ADMINISTRATION
MESSAGE :
OPTIONS : 0
Logical Devices and Spans In Configuration
Num Type Size Dev Num Type Size Dev Num Type Size Dev
0 5 25128 8000* 1 5 25128 8001* 2 5 25128 8002*
3 5 25128 8003* 4 5 25128 8004* 5 12 125640 0
ENTER PARAMETER :
Enter a number to see more detail, esc for previous menu
* indicates logical device is part of a spanning device

View Configuration, Logical Devices with Spans in Configuration Screen

Spanned logical devices are indicated by an asterisk (*), and have a RAID device number starting at 8000.

For more information on spanning, refer to the *Encyclopedia of Controller Fundamentals and Features*, PN 775041. Creating spanned logical devices is currently not supported through the VT100 utility. The utility does recognize spanned logical devices that have been created using other configuration tools.

9. View more detailed information on spanned logical devices by typing the displayed logical device number associated with the spanned logical device. Press **Enter**.

CONTROLLER TYPE aaMB (Ver: aaa) CONFIGURATION / ADMINISTRATION
MESSAGE :
OPTIONS : 0
Logical Device Details -- Physical Devs, Spans, and Logical Device Parameters
Dev Addr State Lba Dev Addr State Lba Dev Addr State Lba
8000 1 0 8001 1 0 8002 1 0
8003 1 0 8004 1 0
Log Device Num : 0 Raid Level : 12 Device State : 1
Log Dev Size (MB): 125648 Cache In size (KB) : 64 Stripe Size (KB) : 64
Phys Devs used : 5 Wrt Thru/Back: Thru
ENTER PARAMETER :
Press any key to continue

View Configuration, Spanned Logical Device Details Screen

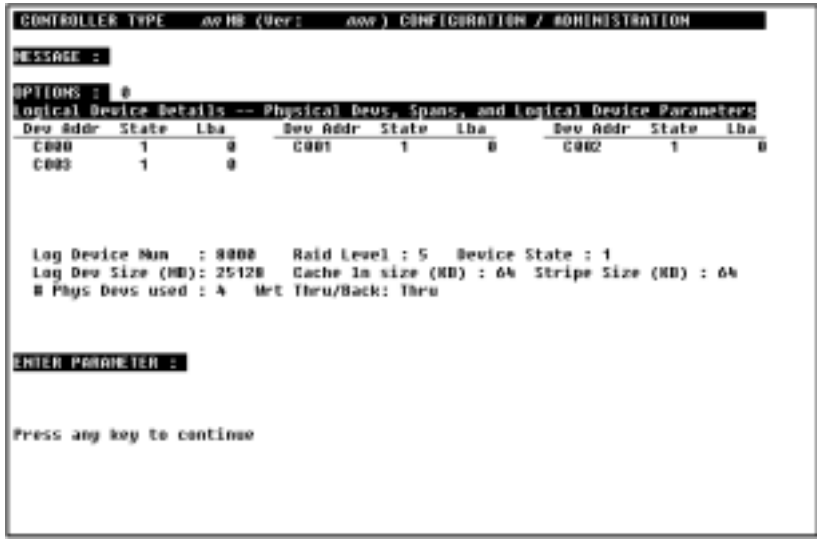
A list of details concerning the specific spanned logical device chosen appears. This lists includes a table of logical devices associated with the spanned logical device, including the following information:

- Device Address—This is a RAID device number randomly assigned to the logical devices that make up the spanned logical device. For more information on RAID devices, refer to the *Firmware/Software Interface Reference Manual, PN 775067.*
- Device State—This represents the physical device state. Refer to “Show Drives, Change Drive State” on page 3-14 for more information.
- Lba—This represents the logical block address of the physical device where the logical device begins.

This list also includes a list of information on the spanned logical device, including:

- Logical Device Number—This is the randomly assigned RAID device number associated with this device.
- Raid Level—RAID level 12 represents a spanned configuration.
- Device State—This represents the logical device state. Refer to “Show Drives, Change Drive State” on page 3-14 for more information.
- Logical Device Size—This is the size, in MB, assigned to this device during the create configuration process.
- Cache Line Size—This represents the size of the data “chunk” that will be read or written at one time and is based on the stripe size.
- Stripe Size—This is the stripe size assigned to the configuration during the create configuration process.
- Number of Physical Devices Used—This is the number of logical devices spanned to create this logical device.
- Write Policy—This indicates whether write-through or write-back caching is used for writing data to disk.

10. View more detailed information on logical devices within a spanned logical device by typing the displayed logical device number associated with the logical device. Press **Enter**.


CONTROLLER TYPE aaMB (Ver: aaa) CONFIGURATION / ADMINISTRATION
MESSAGE :
OPTIONS : 0
Logical Device Details -- Physical Devs, Spans, and Logical Device Parameters
Dev Addr State Lba Dev Addr State Lba Dev Addr State Lba
C000 1 0 C001 1 0 C002 1 0
C003 1 0
Log Device Num : 0000 Raid Level : 5 Device State : 1
Log Dev Size (MB): 25128 Cache Im size (KB) : 64 Stripe Size (KB) : 64
Phys Devs used : 4 Wrt Thru/Back: Thru
ENTER PARAMETER :
Press any key to continue

View Configuration, Logical Devices Within a Span Details Screen

A list of details concerning the specific logical device within a spanned logical device appears. This lists includes a table of physical devices associated with the logical device, including the following information:

- Device Address—This is a RAID device number randomly assigned to the physical devices that make up this logical device. For more information on RAID devices, refer to the *Firmware/Software Interface Reference Manual, PN 775067.*
- Device State—This represents the physical device state. Refer to “Show Drives, Change Drive State” on page 3-14 for more information.
- Lba—This represents the logical block address of the physical device where the logical device begins.

This list also includes information on the logical device, including:

- Logical Device Number—This is the randomly assigned RAID device number associated with this device.
- RAID Level—This represents a valid RAID level.
- Device State—This represents the logical device state. Refer to "Show Drives, Change Drive State" on page 3-14 for more information.
- Logical Device Size—This is the size, in MB, assigned to this device during the create configuration process.
- Cache Line Size—This represents the size of the data "chunk" that will be read or written at one time and is based on the stripe size.
- Stripe Size—This is the stripe size assigned to the configuration during the create configuration process.
- Number of Physical Devices Used—This is the number of physical devices assigned to this logical device.
- Write Policy—This indicates whether write-through or write-back caching is used for writing data to disk.

11. Return to the list of logical devices by pressing any key.

    Repeat Step 5 for detailed information on other logical devices.

12. Press **ESC** to return to the previous screen, or press **ESC** again to return to Configure, Check Drive State menu.

Create New Disk Packs

The Create New Disk Packs function combines selected physical devices into a device group. The device group may be divided into one or more logical devices, each with its own RAID level, write policy, and capacity. Logical devices may be created until the maximum capacity of the device group is fully used or 32 logical devices are defined. Refer to "Create New Disk Packs" on page 2-14 for more details.

Clear Configuration

If you want to create a new configuration, but another configuration already exists, you need to clear the existing configuration before creating a new configuration. Refer to “Clear Configuration” on page 2-11 for more details.

WARNING

Data on the drives is destroyed when the configuration is cleared.

Show Drives, Change Drive State

The Show Drives, Change Drive State function allows the user to view the available devices and to set a device to a specific state. Occasions arise when it is necessary to change the state of a device. Some examples are given in the “Commonly Used Procedures and Troubleshooting Guide” on page 1-8.

The Change Drive State function is also used to recover from accidental drive state changes. If a user changes a failed drive to an Online state by mistake, data integrity may be compromised. Possible devices states are described in Table 3-1.

WARNING

Changing the state of a drive can result in data loss.

Note

The controller stores the state of the attached drives in its non-volatile memory as well as on the disks. This information is retained even after power-off.

Table 3-1. Possible Device States

Device State	Physical Device	Logical Device	Description of Device State
0	Unconfigured Offline	Offline Failed	Physical Device—The device has been inserted and powered on into an unconfigured slot, or the configuration has just been cleared. The device is not part of a configuration. Logical Device—The logical device has suffered failures that exceed the limit for the configured RAID level.
1	Online Optimal	Online Optimal	Physical Device— The device is powered on, part of a configuration, and functioning normally. Logical Device—All devices associated with the configured logical device are powered on and functioning normally.
3	Online Rebuild	Not Applicable	The device is powered on, part of a configuration, and in the process of being rebuilt.
8	Offline Failed	Online Critical	Physical Device—The device has failed to operate properly. Logical Device—The logical device has suffered a device failure within the limit for the configured RAID level.
9	Not Applicable	Online Critical and Rebuilding	The logical device is in the process of rebuilding a failed device.
33 (21h)	Online Spare	Not Applicable	The device is part of a configuration and operating as a spare drive and will be used for automatic rebuild.

☛Note

The number of physical and logical devices shown in the screen captures are an example configuration to show most of the features available on the VT100. These examples may not reflect your system or configuration.

To display the devices and change device states:

1. Select Configure, Check Drive States from the Main Menu by typing **<0>**. Press **Enter**.
2. Select Show Drives, Change Drive State by typing **<6>**. Press **Enter**.

Show Drives, Change Drive State, Select Device Type Screen

3. Select which type of device you want to see. Type **<l>** for logical devices. Press **Enter**.

CONTROLLER TYPE AXHB (Ver: axe) CONFIGURATION / ADMINISTRATION
MESSAGE :
OPTIONS : 3
Logical Devices and States
Log Dev State
0 1
Log Dev State
1 1
Log Dev State
2 1
ENTER PARAMETER :
Enter drive number for state change or hit esc for previous menu
Logical device state definitions:
0 = Offline, 1 = Online, 8 = Online Critical, 9 = Rebuilding

Show Drives, Change Drive State, Logical Device States Screen

A list of logical devices and associated device states appears. A list of possible device states is shown below the command line. Refer to Table 3-1 on page 3-15 for more information on device states. If no logical devices have been created, the Logical Devices and States list is blank.

To change logical device states, continue with Step 4. To show physical devices and change physical device states, skip to Step 6.

4. Enter the device number for a state change. Press **Enter**.

> **☛Note**
>
> The device state for only one device can be changed at a time.

Show Drives, Change Drive State, Logical Device States, Enter New Device State Screen

A prompt appears asking for a new device state. The parameters for the possible device states are provided. Refer to Table 3-1 on page 3-15 for more information on device states.

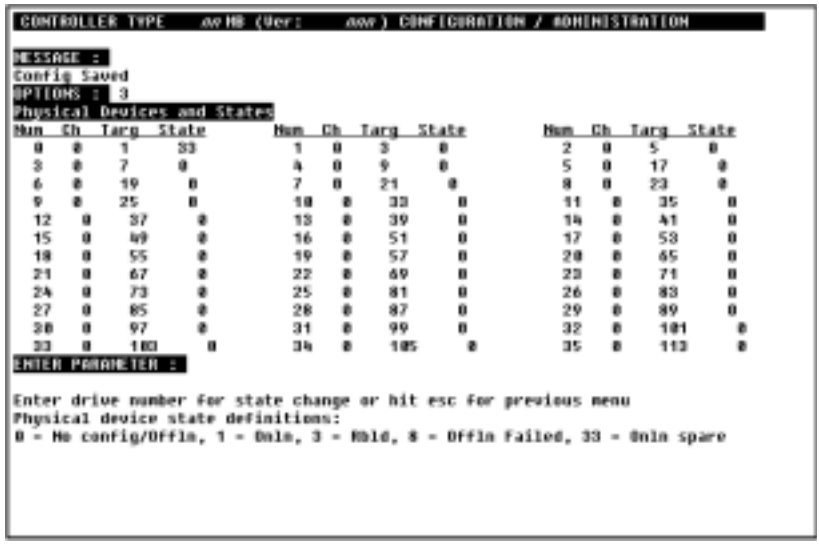
5. Enter the appropriate parameter for the new device state. Press **Enter**.

CONTROLLER TYPE
MESSAGE :
OPTIONS : 3
Logical Devices and States
Log Dev State
Log Dev State
Log Dev State
ENTER PARAMETER :
Enter drive number for state change or hit esc for previous menu
(0 = Offline, 1 = Online, 8 = Online Critical, 9 = Rebuilding)

Show Drives, Change Drive State, Logical Device States, Changed Logical Device State Screen

The screen updates with the new device state and returns the user to Step 4 for additional logical device state changes.

6. Type **<p>** for physical devices. Press **Enter**.

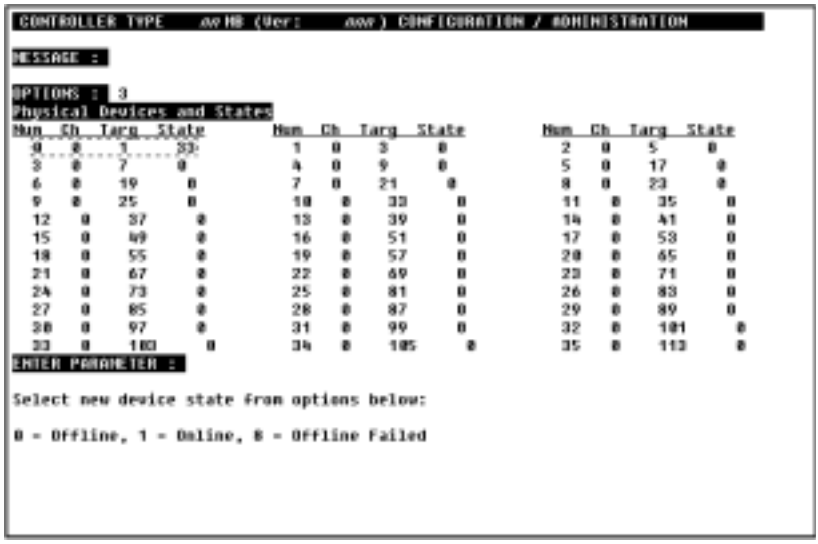

CONTROLLER TYPE aw HB (Ver: aaw) CONFIGURATION / ADMINISTRATION
MESSAGE :
Config Saved
OPTIONS : 3
Physical Devices and States
Num Ch Targ State Num Ch Targ State Num Ch Targ State
0 0 1 33 1 0 3 0 2 0 5 0
3 0 7 0 4 0 9 0 5 0 17 0
6 0 19 0 7 0 21 0 8 0 23 0
9 0 25 0 10 0 33 0 11 0 35 0
12 0 37 0 13 0 39 0 14 0 41 0
15 0 49 0 16 0 51 0 17 0 53 0
18 0 55 0 19 0 57 0 20 0 65 0
21 0 67 0 22 0 69 0 23 0 71 0
24 0 73 0 25 0 81 0 26 0 83 0
27 0 85 0 28 0 87 0 29 0 89 0
30 0 97 0 31 0 99 0 32 0 101 0
33 0 100 0 34 0 105 0 35 0 113 0
ENTER PARAMETER :
Enter drive number for state change or hit esc for previous menu
Physical device state definitions:
0 = No config/Offln, 1 = Onln, 3 = Rbld, 8 = Offln failed, 33 = Onln spare

Show Drives, Change Drive State, Physical Device States Screen

A list of physical devices appears. This list includes an arbitrarily assigned device number, channel:target ID, and the device state. A list of possible device states is shown below the command line. Refer to Table 3-1 on page 3-15 for more information on device states.

7. Enter the device number for a state change. Press **Enter**.

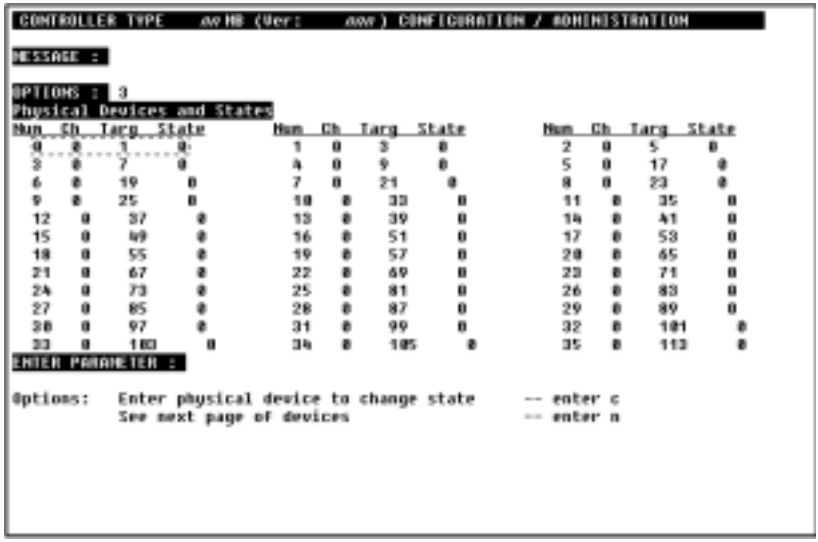
> **☛Note**
>
> The device state for only one device can be changed at a time.



Show Drives, Change Drive State, Enter New Device State Screen

A prompt appears asking for a new device state. The parameters for the possible device states are provided. Refer to Table 3-1 on page 3-15 for more information on device states.

8. Enter the appropriate parameter for the new device state. Press **Enter**.

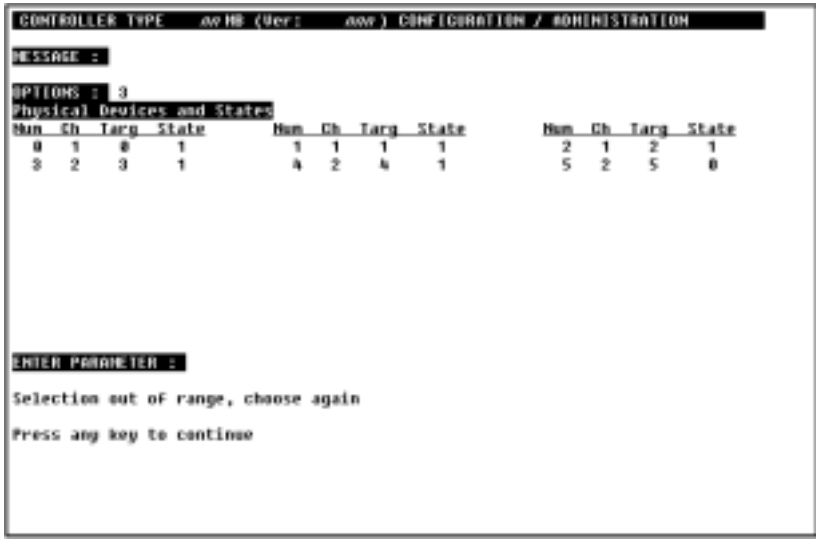

CONTROLLER TYPE aw HB (Ver: aaw) CONFIGURATION / ADMINISTRATION
MESSAGE :
OPTIONS : 3
Physical Devices and States
Num Ch Targ State Num Ch Targ State Num Ch Targ State
0 0 1 0 1 0 3 0 2 0 5 0
3 0 7 0 4 0 9 0 5 0 17 0
6 0 19 0 7 0 21 0 8 0 23 0
9 0 25 0 10 0 33 0 11 0 35 0
12 0 37 0 13 0 39 0 14 0 41 0
15 0 49 0 16 0 51 0 17 0 53 0
18 0 55 0 19 0 57 0 20 0 65 0
21 0 67 0 22 0 69 0 23 0 71 0
24 0 73 0 25 0 81 0 26 0 83 0
27 0 85 0 28 0 87 0 29 0 89 0
30 0 97 0 31 0 99 0 32 0 101 0
33 0 100 0 34 0 105 0 35 0 113 0
ENTER PARAMETER :
Options: Enter physical device to change state -- enter c
See next page of devices -- enter n

Show Drives, Change Drive State, Device State Changed Screen

The screen updates with the new device state and returns the user to Step 7 for additional device state changes.

9. Press **ESC** when finished changing device states to return to the previous menu.

Entering a device number that is not listed results in the following error message.



Show Drives, Change Drive State, Device Number Out Of Range Screen

The user is told the selection is out of range and prompted to choose again by pressing any key to continue.

Search for Physical Devices

The Search for Physical Devices function performs a search for new devices. This feature is used for controllers with a SCSI drive interface. Controllers with a fibre channel drive interface are scanned regularly for new devices through SES and SAF-TE devices. The Search for Physical Devices is invoked immediately and does not return any status.

Add Logical Drive to Existing Physical Device Packs

The Add Logical Drive to Existing Physical Device Packs allows the user to create a new logical device with unused space available on configured device packs. If the user attempts to add a logical device when no device packs have been configured, the following message appears.

CONTROLLER TYPE
MESSAGE :
OPTIONS : 5
0. View Current Configuration
1. Create New Disk Packs
2. Clear Configuration
3. Show Drives, Change Drive State
4. Search For Physical Devices
5. Add Logical Drive to Existing Physical Device Packs
ENTER PARAMETER :
No Packs Found
Press any key to continue

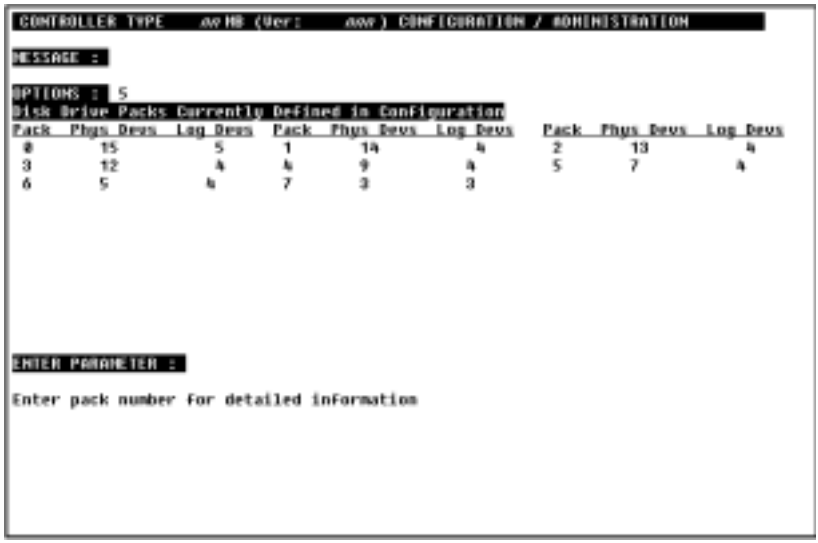
Add Logical Drive to Existing Physical Device Packs, No Configured Packs Found Screen

> **☛Note**
>
> The number of physical and logical devices shown in the screen captures are an example configuration to show most of the features available on the VT100. These examples may not reflect your system or configuration.

To Add Logical Drives to Existing Physical Device Packs:

1. Select Configure, Check Drive States from the Main Menu by typing **<0>**. Press **Enter**.

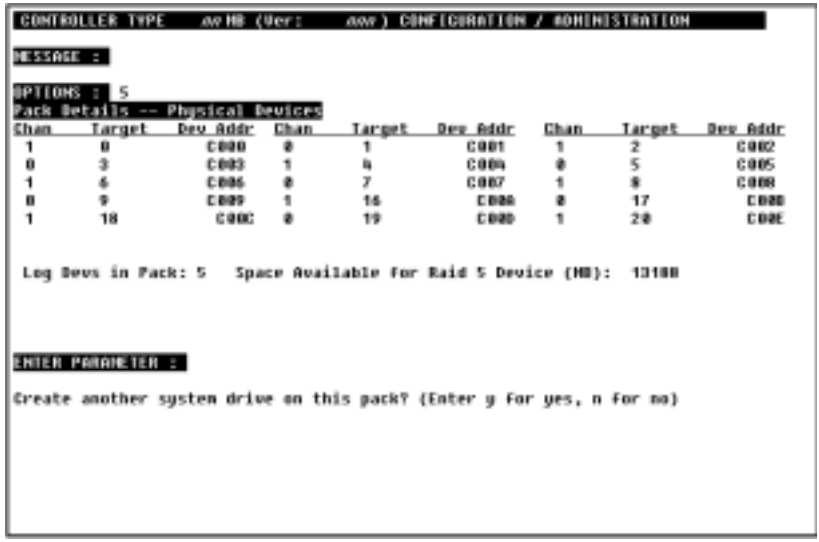
2. Select Add Logical Drive to Existing Physical Device Packs by typing **<5>**. Press **Enter**.


CONTROLLER TYPE
MESSAGE :
OPTIONS : 5
Disk Drive Packs Currently Defined in Configuration
Pack Phys Devs Log Devs Pack Phys Devs Log Devs Pack Phys Devs Log Devs
0 15 5 1 14 4 2 13 4
3 12 4 4 9 4 5 7 4
6 5 4 7 3 3
ENTER PARAMETER :
Enter pack number for detailed information

Add Logical Drive to Existing Physical Device Packs, Currently Defined Disk Drive Packs Screen

A list of Disk Drive Packs Currently Defined in the Configuration appears. The information includes the pack number, the number of physical devices in the pack and the number of logical devices associated with the pack.

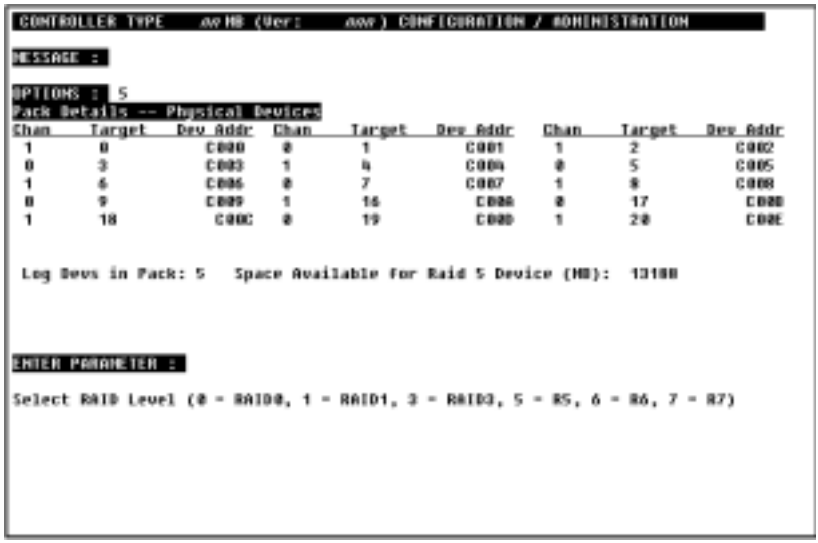
3. For more detailed information on a specific pack, enter the associated pack number. Press **Enter**.


CONTROLLER TYPE
CONFIGURATION / ADMINISTRATION
MESSAGE :
OPTIONS : 5
Pack Details -- Physical Devices
Chan Target Dev Addr Chan Target Dev Addr Chan Target Dev Addr
1 0 C000 0 1 C001 1 2 C002
0 3 C003 1 4 C004 0 5 C005
1 6 C006 0 7 C007 1 8 C008
0 9 C009 1 16 C00A 0 17 C00B
1 18 C00C 0 19 C00D 1 20 C00E
Log Devs in Pack: 5 Space Available for Raid 5 Device (MB): 13188
ENTER PARAMETER :
Create another system drive on this pack? (Enter y for yes, n for no)

Add Logical Drive to Existing Physical Device Packs, Create Another System Drive Screen

A list of physical devices associated with the drive pack appears. The list includes channel:target ID and RAID device address information for each physical device. Logical Device information also appears, including the number of logical devices in the pack and the amount of space (in MB) available for additional *RAID n* devices. The *RAID n* device is the RAID level of the last logical device defined in the device pack. Although logical devices may have only one RAID level, RAID levels can be mixed within a device pack. Possible combinations include RAID 3 and RAID 5, RAID 5 and RAID 0+1 (Mylex 6), and RAID 3 and RAID 0+1. Refer to Table 2-2 for a description of Mylex supported RAID levels. Refer to the *Encyclopedia of Controller Fundamentals and Features* for more information on RAID levels and device packs.

4. Type <**y**> to create another system drive (logical device) or type <**n**> to return to the previous menu. Press **Enter**.

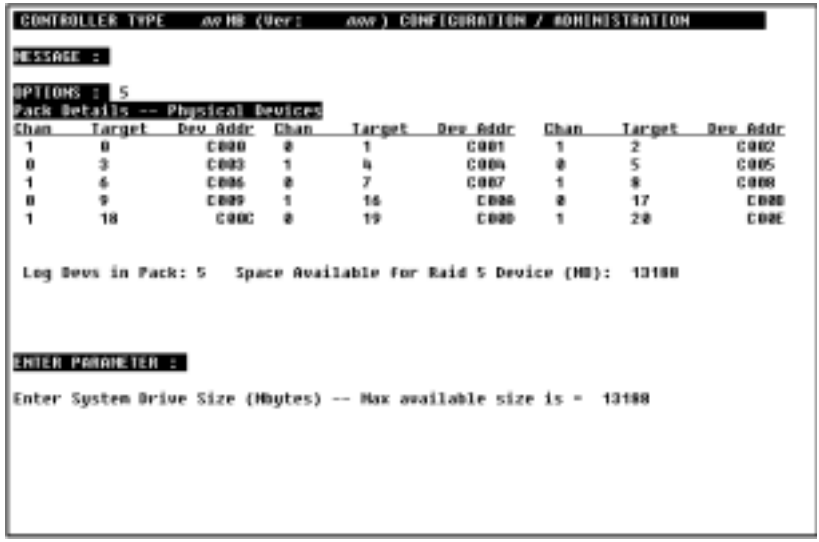

CONTROLLER TYPE
MESSAGE :
OPTIONS : 5
Pack Details -- Physical Devices
Chan Target Dev Addr Chan Target Dev Addr Chan Target Dev Addr
1 0 C000 0 1 C001 1 2 C002
0 3 C003 1 4 C004 0 5 C005
1 6 C006 0 7 C007 1 8 C008
0 9 C009 1 16 C00A 0 17 C00B
1 18 C00C 0 19 C00D 1 20 C00E
Log Devs in Pack: 5 Space Available for Raid 5 Device (MB): 13188
ENTER PARAMETER :
Select RAID Level (0 = RAID0, 1 = RAID1, 3 = RAID3, 5 = R5, 6 = R6, 7 = R7)

Add Logical Drive to Existing Physical Device Packs, Select RAID Level Screen

A new prompt appears at the bottom of the screen asking you to select a RAID level. The parameters for the possible RAID levels are given.

The possible RAID levels and a short description are presented in Table 2-2 on page 2-20. For more detailed information, refer to the *Encyclopedia of Controller Fundamentals and Features*, PN 775041.

Enter the appropriate parameter for the RAID level selected. Press **Enter**.


CONTROLLER TYPE
MESSAGE :
OPTIONS : 5
Pack Details -- Physical Devices
Chan Target Dev Addr Chan Target Dev Addr Chan Target Dev Addr
1 0 C000 0 1 C001 1 2 C002
0 3 C003 1 4 C004 0 5 C005
1 6 C006 0 7 C007 1 8 C008
0 9 C009 1 16 C00A 0 17 C00B
1 18 C00C 0 19 C00D 1 20 C00E
Log Devs in Pack: 5 Space Available for Raid 5 Device (MB): 13188
ENTER PARAMETER :
Enter System Drive Size (Mbytes) -- Max available size is = 13188

Add Logical Drive to Existing Physical Device Packs, Enter Logical Device Size (MB) Screen

A new prompt appears at the bottom of the screen asking you to enter a logical device size (in MB).

5. Enter the drive (device) size (in MB). Press **Enter**.

CONTROLLER TYPE aaMB (Ver: aaa) CONFIGURATION / ADMINISTRATION
MESSAGE :
OPTIONS : 5
Pack Details -- Physical Devices
Chan Target Dev Addr Chan Target Dev Addr Chan Target Dev Addr
1 0 C000 0 1 C001 1 2 C002
0 3 C003 1 4 C004 0 5 C005
1 6 C006 0 7 C007 1 8 C008
0 9 C009 1 16 C00A 0 17 C00B
1 18 C00C 0 19 C00D 1 20 C00E
Log Devs in Pack: 5 Space Available for Raid 5 Device (MB): 13100
ENTER PARAMETER :
Select Write-Thru or Write-Back (0 = Write-Thru, 1 = Write-Back)

Add Logical Drive to Existing Physical Device Packs, Enter Stripe Size Screen

A new prompt appears at the bottom of the screen asking you to select the write policy for the logical device. Write policy is described on page 2-22. For more detailed information, refer to the *Encyclopedia of Controller Fundamentals and Features*, PN 775041.

6. Enter the appropriate parameter for the write policy selected. Press **Enter**.

CONTROLLER TYPE
MESSAGE :
OPTIONS : 5
Logical Device Selections
Log Dev Number : 32
Raid Level : 5
Log Dev State : 1
Log Dev Size (MB) : 400
Stripe Size (KB) : 64
Phys Devs Used: 15
Wrt Back--Wrt Thru: Back
ENTER PARAMETER :
Add this system drive to the configuration? (Enter y for yes, n for no)

Add Logical Drive to Existing Physical Device Packs, Confirm Addition of System Drive to Configuration Screen

A Logical Device Selections screen appears. This information includes the logical device number, the RAID level, the logical device state, the logical device size (MB), the stripe size (KB), the number of physical devices used, and the write policy.

7. To add this system drive (logical device) to the configuration and save the changes, type **<y>**; if not, type **<n>**. Press **Enter**. This saves the configuration immediately.

CONTROLLER TYPE
MB (Ver:
) CONFIGURATION / ADMINISTRATION
MESSAGE :
Config Saved
OPTIONS : S
Logical Device Selection
Log Dev Number : 32
Raid Level : 5
Log Dev State : 1
Log Dev Size (MB) : 498
Stripe Size (KB) : 64
Phys Devs Used: 15
Wrt Back--Wrt Thru: Back
ENTER PARAMETER :
Configuration saved, reset controllers? (y for yes, n for no)

Add Logical Drive to Existing Physical Device Packs, Reset Controllers Screen

A prompt appears notifying the user that the configuration is saved, and asking the user to reset the controllers.

8. To reset the controllers, type **<y>**. Press **Enter**. The controllers will reset immediately after pressing Enter.

> **☛Note**
>
> Depending on the drive spin up settings, the reset function may take several minutes to complete.

9. After the controllers have finished resetting, the STARTUP COMPLETE message appears. Re-enter VT100 mode by typing <**@**> or the appropriate key sequence for your terminal-emulation application.

SANmapping™

SANmapping allows the user to determine complex LUN assignments. SANmapping determines whether a logical device is accessible via one or both host ports on a single controller, or accessible via all host ports on all controllers in a dual-active controller system. SANmapping also determines which host(s) has access to a specific logical device in a multi-host, or SAN (Storage Area Network) environment. Refer to “SANmapping™” on page 2-31 for more details.

Information and Parameters

The Information feature provide information about the controller(s), physical devices, and logical devices including device states, firmware versions, drive size, number of devices present, channel and target IDs. All values presented are for informational purposes only and cannot be changed, however, the information may be useful for creating or editing a configuration.

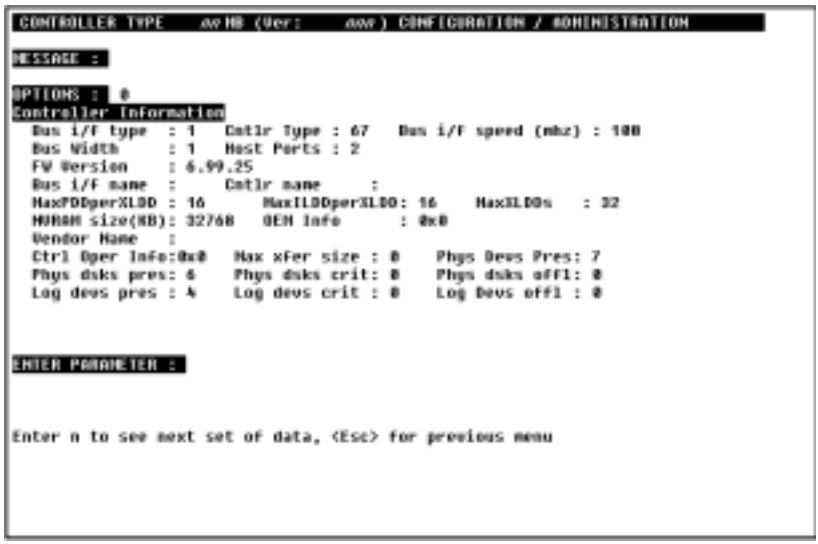
The Parameter features provide changeable settings that effect the operation of the controller. Each Mylex controller is shipped from the factory with initial settings that have been found to work well in a majority of applications and environments. These settings are listed as the controller, logical device, and physical device parameter default settings and vary depending on the product and user requirements. User requirements are not always the same as the suggested default settings, so you may want to modify certain settings.

Get Controller Information

> **☞Note**
>
> The number of physical and logical devices shown in the screen captures are an example configuration to show most of the features available on the VT100. These examples may not reflect your system or configuration.

To view Controller Information:

1. Select Information and Parameters from the Main Menu by typing **<2>**. Press **Enter**.
2. Select Get Controller Information by typing **<0>**. Press **Enter**.


CONTROLLER TYPE
MESSAGE :
OPTIONS : 0
Controller Information
Bus i/F type : 1 Cntlr Type : 67 Bus i/F speed (mhz) : 100
Bus Width : 1 Host Ports : 2
FW Version : 6.99.25
Bus i/F name : Cntlr name :
MaxPDDperXLDD : 16 MaxILDDperXLDD: 16 MaxXLDDs : 32
MDRAM size(MB): 32768 OEM Info : 0x0
Vendor Name :
Ctrl Oper Info:0x0 Max xFer size : 0 Phys Devs Pres: 7
Phys dsks pres: 6 Phys dsks crit: 0 Phys dsks offl: 0
Log devs pres : 4 Log devs crit : 0 Log Devs offl : 0
ENTER PARAMETER :
Enter n to see next set of data, <Esc> for previous menu

Controller Information, First Screen

The first window of Controller Information displays.

3. To see the next window of information, type **<n>**. Press **Enter**.

CONTROLLER TYPE aw HB (Ver: aaw) CONFIGURATION / ADMINISTRATION
MESSAGE :
OPTIONS : 0
Controller Information
Max Parallel Cmds: 8 Phys Chns Pres: 6 Phys Chns Pass: 6
Max Targs Ch0 : 16 Max Targs Ch1 : 16 Max Targs Ch2 : 16
Max Targs Ch3 : 16 Max Targs Ch4 : 16 Max Targs Ch5 : 16
Mem Size (MB) : 8 Cache Size(MB) : 64
FG Inits Active : 8 Con Chks Active: 8 Rebuilds Active: 8
HDNEs active : 8 FG Init Rate : 50
Con Check Rate : 50 Rebuild Rate : 50
Num of CDD Groups : 1
Max IOP : 244
Enquiry stat byte : 0x0 Enquiry Misc Flag : 0x0 Partner FW mismatch : 0
Partner FW Version: 0.0.0
Controller slot 0 WWN : 20.00.00.00.e5.11.02.01 Previous Loop ID : 0xFF
Controller slot 1 WWN : 20.00.00.00.00.00.00.00 Previous Loop ID : 0xFF
ENTER PARAMETER :
Enter <Esc> for previous menu, carriage return for refresh

Controller Information, Second Screen

The second window of Controller Information displays.

4. To return to the previous menu, press **ESC**.

The Controller Information and possible values are described in Table 3-2.

Table 3-2. Controller Information

Information Selection	Definition and Possible Values
Bus i/f type	Bus Interface Type 00=SCSI, 01=Fibre, 03=PCI
Cntlr Type	Controller Type 67=DACFF, 6B=FFx
Bus i/f speed	Bus Interface Speed (MHz)
Bus Width	Bus Width Size (bits) 1=Fibre, 8&16=SCSI/LVD
Host Ports	Number of Host Ports present
FW version	Firmware Version
Bus i/f name	Bus Interface Name (actual string vaule)
Cntlr name	Controller Name (actual string value)

Table 3-2. Controller Information (Continued)

Information Selection	Definition and Possible Values
Max PDD per XLDD	Maximum number of physical device definitions per external or internal logical device definition
Max ILDD per XLDD	Maximum number of internal logical device definitions per external logical device definition
Max XLDDs	Maximum number of external logical device definitions
NVRAM Size (KB)	Non-volatile RAM, Size in KB
OEM Info	OEM Information (from Controller Parameters)
Vendor Name	Vendor Name (actual string vaule)
Ctrl Oper Info	Other Physical/Controller/Operation Information Bit 0 = 1 if IBBU is present Bit 1 = 1 if controller is wroking in Active-Active Clustering mode
Max xfer size	Maximum Transfer size in 512 byte blocks
Phys Devs pres	Physical Devices Present (connected devices includes SAF-TE devices, controllers and drives.
Phys dsks pres	Physical Disks Present Range = 0-124 per disk channel
Phys dsks crit	Physical Disks Critical (marked critical if PFA is received)
Phys dsks offl	Physical Disks Offline
Log devs pres	Logical Devices (XLD) Present Range = 0-32
Log devs crit	Logical Devices (XLD) Critical
Log devs offl	Logical Devices (XLD) Offline
Max Parallel Cmds	Maximum Parallel commands supported
Phys Chns Pres	Number of physical channels present on the controller Range = 2-4
Phys Chans Poss	Maximum number of physical channels possible on this controller Range = 2-6
Max Targs Ch0	Maximum targets possible on physical channel 0 Range = 0-124
Max Targs Ch1	Maximum targets possible on physical channel 1 Range = 0-124
Max Targs Ch2	Maximum targets possible on physical channel 2 Range = 0-124
Max Targs Ch3	Maximum targets possible on physical channel 3 Range = 0-124

Table 3-2. Controller Information (Continued)

Information Selection	Definition and Possible Values
Max Targs Ch4	Maximum targets possible on physical channel 4 Range = 0-124
Max Targs Ch5	Maximum targets possible on physical channel 5 Range = 0-124
Mem Size (MB)	Memory size in MB
Cache Size (MB)	Cache size in MB
FG Inits Active	Number of logical device initializations active
ConChks Active	Number of consistency check active
Rebuilds Active	Number of reubilds active
MOREs Active	Number of MORE active (This feature is not supported at this time.)
FG Init Rate	Initialization Rate
Con Check Rate	Consistency Check rate
Rebuild Rate	Rebuild Rate
Num of COD Groups	Number of Configured Groups
Max IOP	Maximum IOP
Enquiry stat byte	Enquiry Status Byte 10=BBU_NORESPONSE 40=BBU_POWER_LOW 80=DEFERRED_WRITE_ERROR
Enquiry Misc Flag	Enquiry Misc Flag
Partner FW mismatch	Partner Controller FW Mismatch Code
Partner FW Version	Partner Controller FW Version
Controller slot 0 WWN	Controller Identification - Slot0 Node Name—WWN
Previous Loop ID	Previous Loop ID last acquired by each port
Controller slot 1 WWN	Controller Identification - Slot1 Node Name—WWN
Previous Loop ID	Previous Loop ID last acquired by each port

Get Logical Device Information

> **☞Note**
>
> The number of physical and logical devices shown in the screen captures are an example configuration to show most of the features available on the VT100. These examples may not reflect your system or configuration.

To view logical device information:

1. Select Information and Parameters from the Main Menu by typing **<2>**. Press **Enter**.
2. Select Get Logical Device Information by typing **<1>**. Press **Enter**.
3. To obtain information on a specific logical device, type the appropriate device number from the list provided. Press **Enter**.

CONTROLLER TYPE
MESSAGE :
OPTIONS : 1
Logical Device Information
Log Dev State : 1
Raid Level : 5
Stripe Size (KB): 64
Cache Line (KB): 64
RW ctrl : Back
Log Dev Op St: 0x0
RS Write Update: 5
RS Algorithm : 0
Log Dev Num : 2
Device Blk Size: 512
Orig Dev Size (MB): 415
Device Size (MB): 332
Inquiry Data (bytes 0-17): 0 0 2 2 330 1B324D594D4558202020444A1
(bytes 18-35):4339363053462020203333324235353639
Con Chk Blk Num: 0
Reb Blk Num : 0
FG Init Blk Num: 0
MORE Blk Num : 0
Reb Raid Dev : 0
Con Check Stat : 0
Rebuild Stat : 0
FG Init Stat : 100
MORE Stat : 0
ENTER PARAMETER :
Enter <Esc> for previous menu, carriage return for refresh

Logical Device Information Screen

The Logical Device Information window displays.

4. To return to the previous menu, press **ESC**.

The Logical Device Information and possible values are described in Table 3-3.

Table 3-3. Logical Device Information

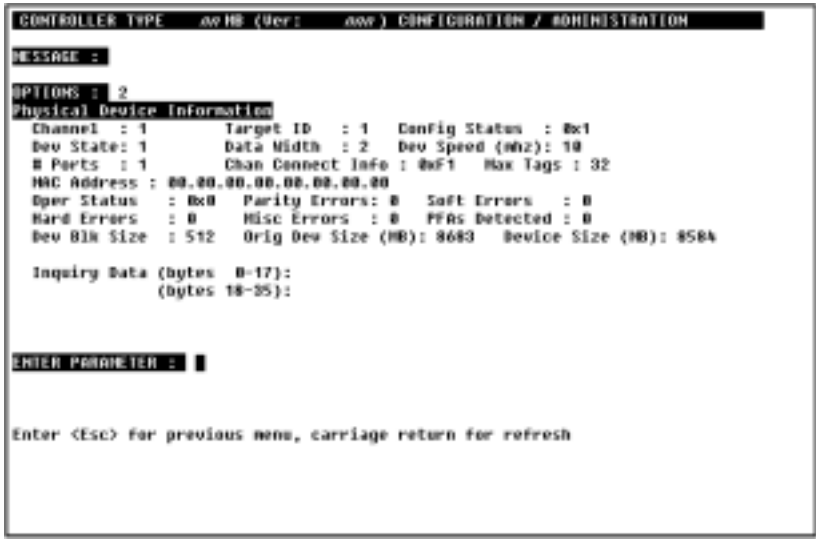
Information Selections	Definition and Range of Values
Log Dev State	Logical Device State
Raid Level	RAID Level
Stripe Size	Stripe Size (KB)
Cache Line Size	Cache line size (KB)
RW Ctrl	Logical Device Read/Write Control
Log Dev Op St	Logical Device Operations Status Bit 0=1 if consistency check is in progress Bit 1=1 if rebuild is in progress Bit 2=1 if making data consistent is in progress Bit 3=1 if logical device initialization is in progress Bit 4=1 if data migration is in progress
R5 Write Update	RAID5 write update (ar5_limit)
R5 Algorithm	RAID5 algorithm (ar5_algo)
Log Dev Num	Logical device number
Device Blk Size	Device block size in bytes
Orig Dev Size	Original device size in 512 byte blocks or MB
Device Size	Device size (configured/configurable) in 512 byte blocks or MB
Inquiry Data	First 36 bytes of SCSI INQUIRY data
Con Chk Blk Num	Consistency check block number
Reb Blk Num	Rebuild block number
FG Init Blk Num	Logical device initialization block number
MORE Blk Num	Data migration block number
Reb Raid Dev	RAID Device Number of Physical Device running Long Op
Con Check Stat	Consistency Check Op Status
Rebuild Stat	Rebuild Long Op Status
FG Init Stat	Logical Device Initialization Long Op Status
MORE Stat	MORE Long Op Status

Get Physical Device Information

> **☞Note**
>
> The number of physical and logical devices shown in the screen captures are an example configuration to show most of the features available on the VT100. These examples may not reflect your system or configuration.

To view physical device information:

1. Select Information and Parameters from the Main Menu by typing **<2>**. Press **Enter**.
2. Select Get Physical Device Information by typing **<2>**. Press **Enter**.
3. To get information on a specific physical device, enter the Channel Number of the physical device. Press **Enter**.
4. Enter the Target ID number of the specific device. Press **Enter**.


CONTROLLER TYPE aw MB (Ver: aw) CONFIGURATION / ADMINISTRATION
MESSAGE :
OPTIONS : 2
Physical Device Information
Channel : 1 Target ID : 1 Config Status : 0x1
Dev State: 1 Data Width : 2 Dev Speed (Mhz): 10
Ports : 1 Chan Connect Info : 0xF1 Max Tags : 32
MAC Address : 00.00.00.00.00.00.00.00
Oper Status : 0x0 Parity Errors: 0 Soft Errors : 0
Hard Errors : 0 Misc Errors : 0 PFAs Detected : 0
Dev Blk Size : 512 Orig Dev Size (MB): 8683 Device Size (MB): 8584
Inquiry Data (bytes 0-17):
(bytes 18-35):
ENTER PARAMETER :
Enter <Esc> for previous menu, carriage return for refresh

Physical Device Information Screen

The Physical Device Information window displays.

5. To return to the previous menu, press **ESC**.

The Physical Device Information and possible values are described in Table 3-4.

Table 3-4. Physical Device Information

Information Selection	Definition
Channel	Channel Number Range = 0-5
Target ID	Target ID Range = 0-126 (excluding 112 and 113)
Config Status	Configuration status bits Bit 0=1 if the physical device is part of a fault tolerant RAID configuration Bit 2=1 if the device is local to the controller Bit 2=0 if the device is remote to the controller.
Dev State	Physical device state (valid only if device is part of a RAID/ Fault-Tolerant configuration)
Data Width	Negotiated data width size in bits
Device Speed	Negotiated physical device speed in MHz per second.
# Ports	Number of port connections available for this device
Chan Connect Info	Channel Connection Information Bit 7: ChnB MSb Bit 6: ChnB Bit 5: ChnB Bit 4: ChnB LSb Bit 3: ChnA MSb Bit 2: ChnA Bit 1: ChnA Bit 0: ChnA LSb
Max Tags	Maximum Number of tags. If the number is 0, device is working in non-tagged mode.
MAC Address	Network address (MAC address). 0 if MAC address is not valid.
Oper Status	Physical device operations status Bit 0=1 if consistency check is in progress Bit 1=1 if rebuild is in progress Bit 2=1 if making data consistent is in progress Bit 3=1 if physicla device initialzation is in progress Bit 4=1 if data migratio is in progress
Parity Errors	Number of Parity Errors
Soft Errors	Number of soft errors

Table 3-4. Physical Device Information (Continued)

Information Selection	Definition
Hard Errors	Number of hard errors
Misc Errors	Number of miscellaneous errors
PFAs Detected	Number of Product Failure Analysis detected
Dev Blk Size	Device block size in bytes. The vaule is 0 for non-block devices
Orig Dev Size	Original device size in 512 byte block or MB. A vaule of 0 for a disk device indicatesthat the device is connected but is not usable.
Device Size	Device size (configurable) in 512 byte block or MB. A vaule of 0 for a disk device indicatesthat the device is connected but is not usable.
Inquiry Data	First 36 bytes of SCSI INQUIRY data.

Get and Set Controller Parameters

Controller Parameters effect the functionality of the controller. These parameters are initially set at the factory with default values that have been found to work well in a majority of applications and environments. Refer to "Information and Parameters" on page 2-1 for a detailed procedure for modifying the default settings. Descriptions of the parameters and associated settings are provided in Appendix B and Table 2-1 on page 2-2.

Get and Set Logical Device Parameters

Changing the Logical Device Parameters cannot be performed until logical devices have been created. The Write Policy Parameter is the only logical device parameter that can be changed.

> **☞Note**
>
> The number of physical and logical devices shown in the screen captures are an example configuration to show most of the features available on the VT100. These examples may not reflect your system or configuration.

To change the logical device parameter:

1. Select Information and Parameters from the Main Menu by typing **<2>**. Press **Enter**.

2. Select Get and Set Logical Device Parameters by typing **<4>**. Press **Enter**.

CONTROLLER TYPE aw HB (Ver: aaw) CONFIGURATION / ADMINISTRATION
MESSAGE :
OPTIONS : 4
0. Get Controller Information
1. Get Logical Device Information
2. Get Physical Device Information
3. Get and Set Controller Parameters
4. Get and Set Logical Device Parameters
5. Get and Set Physical Device Parameters
6. Get Physical Device Statistics
ENTER PARAMETER :
Enter System Drive
(0,1,2)

Get and Set Logical Device Parameter, Enter Logical Device Screen

3. Enter the number for the logical device whose parameters you want to change.

Get and Set Logical Device Parameter, Change Parameter Screen

A list of logical device parameters appears showing the current settings. This list includes the following read-only parameters:

- RAID Level—This is the RAID level associated with the configuration. Refer to Table 2-2 on page 2-20 for more information.
- Logical Device State—This represents the current device state. Refer to “Show Drives, Change Drive State” on page 3-14 for more information.
- Raid Device Number— The RAID device number is assigned by the firmware and is related to the RAID device type.
- Stripe Size—This is the stripe size assigned to the configuration during the create configuration process.

This list also includes the following changeable parameter:

- Read/Write Control—This parameter changes the configured write policy. Write-Through writes data to the device before returning completion status to the host. Write-Back returns a completion status to the host as soon as the cache receives the data. The target device receives the data at a more appropriate time. For more detailed information, refer to the *Encyclopedia of Controller Fundamentals and Features, PN 775041*.

4. Enter <**1**> to change the read/write control, or **ESC** to return to the previous menu.

CONTROLLER TYPE aaMB (Ver: aaa) CONFIGURATION / ADMINISTRATION
MESSAGE :
OPTIONS : 4
Logical Device Parameters
Read Only Parameters
Raid Level : 5 Dev State : 1 RAID Dev Num : 2
Stripe Size (KB): 64
Read-Write Parameters
1) R/W Control : Back
ENTER PARAMETER :
Enter RW Control Value (0 = Write Thru, 1 = Write Back)

Get and Set Logical Device Parameter, Enter RW Control Value Screen

5. Enter the appropriate value for read/write control. Press **Enter**.

Get and Set Logical Device Parameter, Changes Updated Screen

The changes update on the screen. This parameter does *not* require a controller reset to take effect.

6. Press **ESC** to return to the previous menu.

Get and Set Physical Device Parameters

Changing the Physical Device Parameters cannot be performed until The physical device has been configured into a RAID device.

> **☛Note**
>
> The number of physical and logical devices shown in the screen captures are an example configuration to show most of the features available on the VT100. These examples may not reflect your system or configuration.

To change a physical device parameter:

1. Select Information and Parameters from the Main Menu by typing **<2>**. Press **Enter**.
2. Select Get and Set Physical Device Parameters by typing **<5>**. Press **Enter**.

CONTROLLER TYPE
MESSAGE :
OPTIONS : 5
0. Get Controller Information
1. Get Logical Device Information
2. Get Physical Device Information
3. Get and Set Controller Parameters
4. Get and Set Logical Device Parameters
5. Get and Set Physical Device Parameters
6. Get Physical Device Statistics
ENTER PARAMETER :
Enter Channel Number

Get and Set Physical Device Parameter, Enter Channel Number Screen

3. Enter the Channel Number of the physical device for which parameters are being changed. Press **Enter**.

CONTROLLER TYPE aw MB (Ver: aww) CONFIGURATION / ADMINISTRATION
MESSAGE :
OPTIONS : 5
0. Get Controller Information
1. Get Logical Device Information
2. Get Physical Device Information
3. Get and Set Controller Parameters
4. Get and Set Logical Device Parameters
5. Get and Set Physical Device Parameters
6. Get Physical Device Statistics
ENTER PARAMETER :
Enter Target ID

Get and Set Physical Device Parameter, Enter Target ID Screen

4. Enter the Target ID for the physical device for which parameters are being changed. Press **Enter**.

CONTROLLER TYPE aw HB (Ver: aaw) CONFIGURATION / ADMINISTRATION
MESSAGE :
OPTIONS : 5
Physical Device Parameters
1) Transfer Speed (mhz): 0 2) Transfer Width (bits): 0
ENTER PARAMETER :
Enter <Esc> for previous menu, a digit (1-2) to set a parameter

Get and Set Physical Device Parameter, Enter Parameter Screen

A list of physical device parameters appears showing the current settings. This list includes:

- Transfer Speed (MHz)—This parameter sets the maximum transfer rate for each device. The possible settings are 0 for asynchronous, 5, 10, 20, 40, 80, and 1000 for fibre.
- Transfer Width (bits)—This parameter determines the maximum data transfer width size in bits. The possible settings are 0=serial, 1=8 bits, and 2=16 bits.

5. Select the parameter you wish to change and enter the corresponding number, or press **ESC** to return to the previous menu. Press **Enter**.

CONTROLLER TYPE
MB (Ver:
) CONFIGURATION / ADMINISTRATION
MESSAGE :
OPTIONS : 5
Physical Device Parameters
1) Transfer Speed (Mhz): 0
2) Transfer Width (bits): 0
ENTER PARAMETER :
Enter transfer speed (Mhz, valid values are 10, 20, 40, 80, 1000 (Fibre))

Get and Set Physical Device Parameter, Enter Parameter Value Screen

The selected parameter and a range of possible values appears.

6. Enter the new value for this physical device parameter. Press **Enter**.

   The physical device parameter is updated.

7. Select another parameter to change or press **ESC** to return to the Information and Parameters menu.
8. Reset controllers. These changes do not take effect until the controllers have been reset. Refer to “Reset Controller or Channel” on page 3-74 for information on resetting the controllers.

Get Physical Device Statistics

> **☛Note**
>
> The number of physical and logical devices shown in the screen captures are an example configuration to show most of the features available on the VT100. These examples may not reflect your system or configuration.

To view the Physical Device Statistics:

1. Select Information and Parameters from the Main Menu by typing **<2>**. Press **Enter**.
2. Select Get Phys Device Stats by typing **<6>**. Press **Enter**.
3. To obtain statistics on a specific physical device, enter the Channel Number of the device. Press **Enter**.
4. Enter the Target ID of the device. Press **Enter**.

CONTROLLER TYPE
MESSAGE :
OPTIONS : 6
Physical Device Statistics
Channel : 1 Target ID : 1 msec from startup : 93808
Num Reads Done : 0 Num Writes Done : 0
Num Cmds Active : 0 Num Cmds Waiting : 0
ENTER PARAMETER :
Enter <Esc> for previous menu, carriage return for refresh

Physical Device Statistics Screen

The Physical Device Statistics window displays.

5. To return to the previous menu press **ESC**.

The Physical Device Statistics definitions and possible values are described in Table 3-5.

Table 3-5. Physical Device Statistics

Statistic Parameter	Definition and Range of Values
Channel	Channel Number (Range = 0-5)
Target ID	Target ID (Range = 0-124)
Msec from startup	Number of Milliseconds from last system/controller power up
Num Reads Done	Number of reads done
Num Writes Done	Number of writes done
Num Cmds Active	Number of commands active on device
Num Cmds Waiting	Number of commands waiting to go on device

Start or Stop Long Ops

Start Foreground Initialization

To perform a Foreground Initialization, refer to “Start Foreground Initialization” on page 2-43.

Stop Foreground Initialization

To stop a Foreground Initialization that is in progress, refer to “Stop Foreground Initialization” on page 2-46.

Start Consistency Check

> **☛Note**
>
> The number of physical and logical devices shown in the screen captures are an example configuration to show most of the features available on the VT100. These examples may not reflect your system or configuration.

To perform a Consistency Check:

1. Select Start or Stop Long Ops from the main menu by typing <**3**>. Press **Enter**.
2. Select Start Consistency Check by typing <**2**>. Press **Enter**.

Start Consistency Check, Enter Logical Device Screen

3. Enter the number of the system drive for which the consistency check is performed. Press **Enter**.

Start Consistency Check, Successfully Started Screen

The consistency check starts immediately. The option prompt indicates that the parity check has started successfully. The message line provides a progressive report on the percentage of consistency check completed.

4. Press any key to continue. Select additional system drives for consistency check as described in Step 3.

Start Consistency Check, Completed Screen

The message line indicates when the consistency check has completed.

5. Press any key to return to the Start or Stop Long Ops menu.

Stop Consistency Check

To stop a consistency check that is in progress:

1. From the Start or Stop Long Ops menu, select Stop Consistency Check by typing <**3**>. Press **Enter**.

Start Consistency Check, Stopped (Failed) Screen

The consistency check stops immediately. The message line indicates that the consistency check has failed due to code #4. Refer to Appendix A for a complete list of messages.

2. Press any key to return to the Start or Stop Long Ops menu.

Start Consistency Check with Restore

☛Note

The number of physical and logical devices shown in the screen captures are an example configuration to show most of the features available on the VT100. These examples may not reflect your system or configuration.

To perform a Consistency Check with Restore:

1. Select Start or Stop Long Ops from the Main Menu by typing <**3**>. Press **Enter**.
2. Select Start Consistency Check w/Restore by typing <**4**>. Press **Enter**.

Start Consistency Check with Restore, Enter Logical Device Screen

3. Enter the number of the system drive for which the consistency check with restore is performed. Press **Enter**.

Start Consistency Check with Restore, Successfully Started Screen

The consistency check with restore starts immediately. The option prompt indicates that the parity check started successfully. The message line provides a progressive report on the percentage of consistency check completed.

4. Press any key to continue. Select additional system drives for consistency check with restore as described in Step 3.

Start Consistency Check with Restore, Completed Screen

The message line indicates when the consistency check with restore has completed.

5. Press any key to return to the Start or Stop Long Ops menu.

Stop Consistency Check with Restore

To stop a consistency check with restore that is in progress:

1. From the Start or Stop Long Ops menu, select Stop Consistency Check w/Restore by typing <**5**>. Press **Enter**.

CONTROLLER TYPE awMB (Ver: awp) CONFIGURATION / ADMINISTRATION
MESSAGE :
CHCK FAILED:CODE #4
OPTIONS : 5
0. Start Foreground Initialization
1. Stop Foreground Initialization
2. Start Consistency Check
3. Stop Consistency Check
4. Start Consistency Check w/Restore
5. Stop Consistency Check w/Restore
6. Start Rebuild
7. Stop Rebuild
ENTER PARAMETER :
Press any key to continue

Start Consistency Check with Restore, Stopped (Failed) Screen

The consistency check with restore stops immediately. The message line indicates that the consistency check with restore failed due to code #4. Refer to Appendix A for a complete list of messages.

2. Press any key to return to the Start or Stop Long Ops menu.

Start Rebuild

Use the Rebuild function after a drive fails and is replaced. This function restores the original information on the replacement drive. This function is used if the automatic rebuild controller parameter is not enabled.

The Automatic Rebuild feature performs this operation without user intervention if the following conditions are met:

- Automatic Rebuild is enabled.
- Operational Fault Management is enabled.
- An online spare is available and configured, or a replacement drive has been inserted into the failed drive's configured location.

> ⚠ ***Caution***
>
> The replacement drive size must be the same or larger than the failed drive.

> ☛**Note**
>
> Rebuilding a drive may impact controller performance. Use the Rebuild and Check Consistency Rate function described in Appendix B and Table 2-1 on page 2-2 to vary the resources that the controller allocates to the Rebuild process.

> ☛**Note**
>
> The number of physical and logical devices shown in the screen captures are an example configuration to show most of the features available on the VT100. These examples may not reflect your system or configuration.

To perform the Rebuild function:

1. Select Start or Stop Long Ops from the Main Menu by typing <**3**>. Press **Enter**.
2. Select Start Rebuild by typing <**6**>. Press **Enter**.
3. Enter the Channel Number of the physical device that will be rebuilt (the failed device). Press **Enter**.

4. Enter the Target ID of the physical device that will be rebuilt (the failed device). Press **Enter**.

Start Rebuild, Successfully Started Screen

The Rebuild starts immediately. The option prompt indicates that the rebuild started successfully. The message line provides a progressive report on the percentage of rebuild completed.

5. Press any key to continue.

Start Rebuild, Completed Screen

The message line indicates when the rebuild has completed.

6. Press any key to return to the Start or Stop Long Ops menu.

If an incorrect Channel:Target ID number is given for the physical device to be rebuilt, the following error message appears.

Start Rebuild, Invalid Device Address Screen

Press any key to continue.

Stop Rebuild

To stop a rebuild that is in progress:

1. From the Start or Stop Long Ops menu, select Stop Rebuild by typing <**7**>. Press **Enter**.

Start Rebuild, Stopped (Failed) Screen

The rebuild stops immediately. The message line indicates that the rebuild failed due to code #4. Refer to Appendix A for a complete list of messages.

2. Press any key to return to the Start or Stop Long Ops menu.

Controller and Host Operations

Get Dual Controller Status

> **☛Note**
>
> The number of physical and logical devices shown in the screen captures are an example configuration to show most of the features available on the VT100. These examples may not reflect your system or configuration.

To view dual controller status:

1. Select Controller and Host Operations from the Main Menu by typing <**4**>. Press **Enter**.
2. Select Get Dual Controller Status by typing <**0**>. Press **Enter**.

Get Dual Controller Status Information, Screen

The Dual Controller Status Information screen displays.

3. To return to the Controller and Host Operations menu, press **ESC**. To refresh the Dual Controller Status Information screen, press **Enter** (carriage return).

The Dual Controller Status Information and possible values are described in Table 3-6 through Table 3-10.

Table 3-6. Dual Controller Status Information

Information Selection	Definition and Range of Values
Status Format	The Format field indicates the presence of the LUN and logical device information. This is currently set to 2.
LUN	The LUN field identifies the LUN on which the Get Dual Controller Status command was received.
Sys Drive	The Sys drive field identifies the logical device to which the LUN maps.
Length	The Information Length field specifies the length of data following.
State (hex)	The Master/Slave State field spcifies the current state of the controller-controller nexus. For a list of values and descriptions for possible states, refer to Table 3-7.
State Info (hex)	The Master/Slave State Additional Information field gives more information on the relavant Master/Slave state. For a list of values and descriptions of the additional information, refer to Table 3-8.
Partner Status (hex)	The Partner Status field describes the current status of the partner controller. For a list of values and descriptions of the partner status, refer to Table 3-9.
Controller Info (hex)	The Dual-Active Controller Information field provides information about the dual-active controller, refer to Table 3-10.

Table 3-7. Master/Slave States

Value	Description
00h	Disabled or Simplex
10h	Initial State during Dual Active Boot
12h	Negotiation with Partner Complete
15h	Controller-Controller Nexus Established
17h	Negotiation with Partner Not Complete
20h	Controller in Slot 1 Failed
21h	Controller in Slot 1 Ejected

Table 3-7. Master/Slave States (Continued)

Value	Description
22h	Controller in Slot 1 Removal Detected
23h	Controller in Slot 1 Inserted
24h	Command Controller in Slot 1 Inserted
25h	Command Controller in Slot 1 to Pause
26h	Paused Controller Slot 1 Ready to Resume
27h	Paused Controller Slot 1 Failed
80h	Controller in Slot 0 Failed
81h	Controller in Slot 0 Ejected
82h	Controller in Slot 0 Removal Detected
83h	Controller in Slot 0 Inserted
84h	Command Controller in Slot 0 Inserted
85h	Relinquish Control of Slot 1

Table 3-8. Master/Slave State Additional Information

Value	Description
0000h	No additional information available.
0106h	Firmware Download to Slave Failed
0110h	Write Back Synchronization Failed on Channel 0
0111h	Write Back Synchronization Failed on Channel 1
0112h	Write Back Synchronization Failed on Channel 2
0113h	Write Back Synchronization Failed on Channel 3
0114h	Write Back Synchronization Failed on Channel 4
0115h	Write Back Synchronization Failed on Channel 5

Table 3-9. Partner Status

Value	Partner State	Description
0000h	No Partner	Controller is running in simplex mode
0100h	Booting	From Power-up
0101h	Booting	Partner is replacement controller
0200h	Active	Controller-Controller Nexus
0201h	Active	Partner is survivor
0300h	Failed	Ping Time-out
0301h	Failed	Negotiation - Get chunk failure

Table 3-9. Partner Status (Continued)

Value	Partner State	Description
0302h	Failed	Negotiation - SCSI Communication Failed or Cables are wrong or Firmware versions/builds are different
0303h	Failed	Negotiation - Host ID mismatch
0304h	Failed	Negotiation - SLIP/DIFFL/FBF Mismatch
0305h	Failed	Negotiation - Disk Channels available mismatch
0306h	Failed	Negotiation - Host Channels available mismatch
0307h	Failed	Negotiation - Firmware version mismatch
0308h	Failed	Negotiation - Firmware type mismatch
0309h	Failed	Negotiation - Memory size mismatch
030ah	Failed	Negotiation - Memory read of partner failed
030bh	Failed	Negotiation - MS_INTNEG command to partner failed
030ch	Failed	Kill Partner command received
030dh	Failed	Partner failed during failback TID handover
030eh	Failed	Partner did not enter nexus after negotiation complete
030fh	Failed	Partner failed for unknown reason
0310h	Failed	Write Back Synchronization Failed on Channel 0
0311h	Failed	Write Back Synchronization Failed on Channel 1
0312h	Failed	Write Back Synchronization Failed on Channel 2
0313h	Failed	Write Back Synchronization Failed on Channel 3
0314h	Failed	Write Back Synchronization Failed on Channel 4
0315h	Failed	Write Back Synchronization Failed on Channel 5
0316h	Failed	Negotiation - Firmware build mismatch

Table 3-9. Partner Status (Continued)

Value	Partner State	Description
0317h	Failed	Negotiation - Device Channel cables are crossed
0320h	Failed	Hot pull of partner detected while nexus active
0321h	Failed	Partner absent at boot
0322h	Failed	Power failed before failover finished
0323h	Failed	Power failed before relinquish finished
0324h	Failed	Controller-Controller locking had unrecoverable SCSI error
0400h	Removed	Partner is removed
0500h	Inserted	Partner is inserted

Table 3-10. Dual-Active Controller Information

Field	Description
Navtive Slot Number	Identifies the controller slot number that services the Target ID used to send this command when there is no failed controller.
Controller Slot Number	Identifies the actual controller slot number.
Native TID	Set if this command was received on the controller's primary TID.
SCSI TID	Identifies the TID used to send this command.
Port ID	Identifies either the TID used to send this command (parallel SCSI) or the Loop ID used to send this command (Fibre SCSI).

Kill Partner

The Kill Partner function allows the user to hold one controller in reset when operating in a dual-active configuration, forcing the system into simplex mode.

To issue the Kill Partner command:

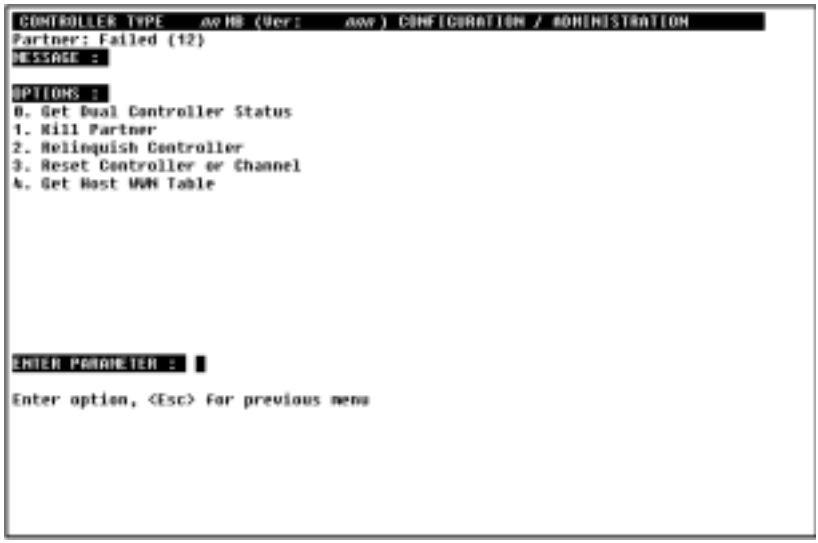
1. Select Controller and Host Operations from the Main Menu by typing <**4**>. Press **Enter**.
2. Select Kill Partner by typing <**1**>. Press **Enter**.

CONTROLLER TYPE
Partner: Active
MESSAGE :
OPTIONS : 1
0. Get Dual Controller Status
1. Kill Partner
2. Relinquish Controller
3. Reset Controller or Channel
4. Get Host WWN Table
ENTER PARAMETER :
Are you sure you want to kill the partner (y for yes, esc for previous menu)

Kill Partner Controller, Confirmation Screen

3. Confirm that you want to issue the Kill Partner command by typing <**y**>. Press **Enter**. The Kill Partner function occurs immediately. If you

do not want to kill the partner controller, press **ESC** to return to the previous menu.



Kill Partner Controller, Partner Failed Notification Screen

A status message appears stating that the partner has failed due to error #12, indicating a Kill Partner command was received.

4. Press **ESC** to return to the previous menu.

Relinquish Controller

The Relinquish Controller function is used to restart a controller that has been held in reset in a dual-active configuration. The Relinquish Controller function is used to bring a replacement controller online.

> **☛Note**
>
> The Relinquish Controller function starts a failback operation that, depending on the drive spin up settings, may take several minutes. When the failback is complete, a message appears.

To issue the Relinquish Controller command:

1. Select Controller and Host Operations from the Main Menu by typing <**4**>. Press **Enter**.
2. Select Relinquish Controller by typing <**2**>. Press **Enter**.

CONTROLLER TYPE
Partner: Failed (12)
MESSAGE :
OPTIONS : 2
0. Get Dual Controller Status
1. Kill Partner
2. Relinquish Controller
3. Reset Controller or Channel
4. Get Host WWN Table
ENTER PARAMETER :
Are you sure you want to relinquish the partner (y for yes, esc for prev menu)

Relinquish Partner Controller, Confirmation Screen

3. Confirm that you want to issue the Relinquish Partner command by typing <**y**>. Press **Enter**. The Relinquish Partner function occurs

immediately. If you do not want to relinquish the partner controller, press **ESC** to return to the previous menu.

Relinquish Partner Controller, Partner Active Notification Screen

A status message appears stating that the partner controller is now active.

4. Press **ESC** to return to the previous menu.

Reset Controller or Channel

Some controller parameters do not take effect until the controllers have been reset. Mylex also recommends resetting the controllers after creating a new array configuration. The reset channel function issues a bus reset to the selected channel.

To reset the controller(s) or channel:

1. Select Controller and Host Operations from the Main Menu by typing **<4>**. Press **Enter**.
2. Select Reset Controller or Channel by typing **<3>**. Press **Enter**.

Controller and Host Operations, Reset Controller or Channel Screen

3. Select Channel by typing <**p**>. Press **Enter**.

Controller and Host Operations, Reset Channel Screen

4. Select the appropriate channel number to reset. The channel reset is invoked immediately, does not return any status, and returns to the Controller and Host Operations menu.

   Select Controller by typing **<c>**. Press **Enter**. The controllers will reset immediately.

   ☛Note

   Depending on the drive spin up settings, the reset function may take up to two minutes to complete.

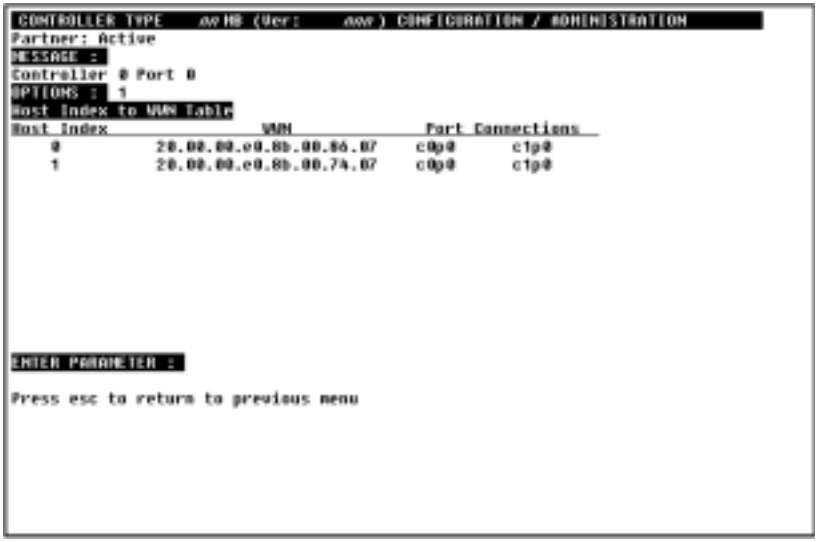
   After the controllers have finished resetting, the STARTUP COMPLETE message appears. Re-enter VT100 mode by typing <**@**> or the appropriate key sequence for your terminal-emulation application.

Get Host WWN Table

> **☛Note**
>
> The number of physical and logical devices shown in the screen captures are an example configuration to show most of the features available on the VT100. These examples may not reflect your system or configuration.

To view the Host Index to WWN Table:

1. Select Controller and Host Operations from the Main Menu by typing <**4**>. Press **Enter**.
2. Select Get Host WWN Table by typing <**4**>. Press **Enter**.



Host Index to WWN Table Screen

The Host Index to WWN Table displays. This table is also accessible through the “SANmapping™” function described on page 2-31. This table is recreated everytime the configuration is cleared.

3. Press **ESC** to return to the previous menu.

Change Serial Port Usage

The serial port can be configured as the VT100 Terminal Emulation interface or as a trouble shooting debug tool. Temporarily switching the serial port to debug mode is performed only under recommendation and direction from a technical service representative. A password is required to enter debug mode.

> ⚠ ***Caution***
>
> Returning to VT100 mode after being in debug mode requires assistance from a technical service representative.

To configure the serial port for temporary debug mode:

1. Select Configure Serial Port from the Main Menu by typing <**5**>. Press **Enter**.

Configure Serial Port Screen

⚠ *Caution*

The user cannot escape from this action after pressing Enter. To return to VT100 mode, the user has to manually reset the controllers.

2. Select Switch to Debug Mode by typing <**0**>. Press **Enter**.
3. Press **Enter** a second time to activate the debug menu.

Debug Password Request Screen

The user is prompted for a password to enable the debug menu. This password is only available from a technical service representative.

Appendix A
Messages and Error Codes

This appendix provides lists of possible error messages and error codes. The messages appear on the LCD screen, if one is present, or under the MESSAGE: bar on the VT100 screen. The messages provide the user with information, error conditions, and command progress. The Messages are described in Table A-1, and the Error Codes are described in Table A-2. Certain features associated with some of the messages and error codes are not supported at this time.

Messages

Table A-1. Messages

Message	Description
AEMI scan reject #	AEMI scan was rejected
CHCK Failed: Code #	Parity check failed
Check SDRV #: %	Status monitoring the progress of parity check on system drive #. The LCD must be in monitor mode to receive this message.
CHK SDRV # Complete	Parity check on system drive # has completed
CHK Started SDRV #	Parity check on system drive # has started
DRV Replaced by C:I	A drive has been replaced by Channel:ID
Error Code : *nnnn*	Diagnostics failed, number indicates type of failure
Fail:Chk/Rbl in Prog	Failure due to a parity check or rebuild already in progress
Failed: Bad EEPROM	Failure saving the configuration to EPROM
Failed: Bad NVRAM	Failure saving the configuration to non-volatile RAM
Failed: Channel Busy	Drive channel is busy

Table A-1. Messages (Continued)

Message	Description
Failed: Check in Prog	A parity check is in progress on the addressed system drive
Failed: Disk failed	New disk failure
Failed: Drive Dead	Failure due to a dead dependent drive
Failed: Drv Not Ready	Unable to start drive
Failed: Init in prog	Failed because an initialization is in progress
Failed: Invalid Dev	Failure due to an invalid device
Failed: Invalid SDRV	Failure due to a non-redundant or non-existent system drive
Failed: No Device	Drive or other device not available
Fail: Rbl/Chk in Prog	Rebuild failed; another rebuild or parity check is in progress
Failed: Start failed	Rebuild failed; drive could not start or is online
Failed: Unknown SDRV	System drive operation failed; affinity is not assigned to this controller
Failed: State Changed	A change of state has occurred
Fan Failure #	A failed fan has been detected
Fatal Err: RAM Failed	The memory has failed
Fatal Err: RAM Parity	A parity error has occurred on the memory
Fatal Err: FW Chksum	A checksum reveals corrupted firmware
Hardware Err: #	A hardware error has occurred
ID C:I Can't Rebuild	Drive with ID Channel: ID can't perform a rebuild
ID C:I Drive Failed	Drive with ID Channel:ID has failed
ID C:I Not Responding	Drive with ID Channel:ID is not responding
ID C:I Removed	Drive with ID Channel:ID has been removed
ID n:n Set to RBLD	Drive with ID Channel:ID has had a state change to rebuild

Table A-1. Messages (Continued)

Message	Description
ID n:n Set to SBY	Drive with ID Channel:ID has had a state change to standby
ID n:n Unconfigured	Drive with ID Channel:ID is not configured
ID Mismatch at n:n	An ID mismatch has occurred with drive Channel:ID
Illegal Request	Operation is no longer supported
Illegal Operation	Operation is illegal; there is no Master/Slave configuration
Init SDRV #: %	Status monitoring the progress of initalization on system drive #. The LCD must be in monitor mode to receive this message.
Init SDRV Complete	Initialization on system drive # has completed
Invalid drive	Invalid choice of drive
Invalid Device #	Invalid device address
Invalid Option	A submenu was not selected when required
Mirror-Race Checksum	Following a power cycle, a check is performed on the Mirror-Race Table for valid data and parity
Mirror-Race CR SD #	A mirror-race is being performed on critical system drive #
New COD Config	A new COD configuration has been detected and will be accepted by the controller
No arrays defined	There are no system drives to delete
Non-Redundant Power	SES and SAF-TE systems only—multiple power supplies are no longer functioning, the system is operating with one power supply and has been forced in conservative cache mode
No SDRVs defined	Invalid configuration
OVR-TEMP Failure	The enclosure has detected a temperature above the allowed limit
Operation complete	The invoked operation has successfully completed
Parity Check Error	A drive parity error has been detected
Partner : booting	From power-up or Partner is replacement controller
Partner : active	Controller-Controller nexus is established or Partner is survivor
Partner : failed 0	Ping Time out

Table A-1. Messages (Continued)

Message	Description
Partner : failed 1	Negotiation—unable to allocate chunk of memory
Partner : failed 2	Negotiation—SCSI communication failed or cables are wrong
Partner : failed 3	Negotiation—host ID jumper mismatch
Partner : failed 4	Negotiation—SLIP/DIFFL/FBR jumper mismatch
Partner : failed 5	Negotiation—number of disk channels available mismatch
Partner : failed 6	Negotiation—number of host channels available mismatch
Partner : failed 7	Negotiation—firmware version mismatch
Partner : failed 8	Negotiation—firmware type mismatch
Partner : failed 9	Negotiation—memory size mismatch
Partner : failed 10	Negotiation—memory read of partner failed
Partner : failed 11	Negotiation—cache memory size mismatch
Partner : failed 12	Kill Partner command received
Partner : failed 13	Partner failed during failback TID handover
Partner : failed 14	Partner didn't enter nexus after negotiation complete
Partner : failed 15	Partner failed for unknown reason
Partner : failed 16	Write Back Synchronization Failed on Channel 0
Partner : failed 17	Write Back Synchronization Failed on Channel 1
Partner : failed 18	Write Back Synchronization Failed on Channel 2
Partner : failed 19	Write Back Synchronization Failed on Channel 3
Partner : failed 20	Write Back Synchronization Failed on Channel 4
Partner : failed 21	Write Back Synchronization Failed on Channel 5
Partner : failed 22	Negotiation—firmware build mismatch
Partner : failed 23	Negotiation—device cables are crossed
Partner : failed 31	Room for channel expansion
Partner : failed 32	Hot pull of partner detected while nexus active
Partner : failed 33	Partner absent at boot
Partner : failed 34	Power failed before failover finished
Partner : failed 35	Power failed before relinquish finished

Table A-1. Messages (Continued)

Message	Description
Partner : removed	Partner is removed
Partner : inserted	Partner is inserted
Possible Data Loss	Possible data loss has occurred
PWR-SPLY Failure #	A power supply failure has been detected
Race Recovery Begun	Mirror-race recovery has begun
RBLD C:I Complete	The rebuild process has completed on drive Channel:ID
RBLD Failed: Code #	The rebuild process has failed
RBLD SDRV #: %	Status monitoring the progress of a rebuild operation on system drive #. The LCD must be in monitor mode to receive this message
RBLD Started SDRV #	A rebuild operation has started on system drive #
RestoreCf1 NVR2>NVR1	A configuration mismatch has been detected between NVRAM1 and NVRAM 2
RestoreCf1 NVR1>NVR2	A configuration mismatch has been detected between NVRAM1 and NVRAM 2
RestoreCf2 NVR2>NVR1	A configuration mismatch has been detected between NVRAM1 and NVRAM 2
RestoreCf2 NVR1>NVR2	A configuration mismatch has been detected between NVRAM1 and NVRAM 2
SBY size too small	Standby Drive is too small for the existing configuration
SEr: *n*	The number of drive soft errors
SSU Fail C:I	A start spin up (SSU) command has failed on drive Channel:ID
Standby Created	A standby drive has been successfully created
STARTUP COMPLETE	The controller(s) has successfully completed a power-on self test
UPS AC Power Failure	AC power to the UPS failed, displayed if UPS is supported and enabled

Table A-1. Messages (Continued)

Message	Description
Warm Start Complete	A power cycle occurred and successfully completed while the controller is performing I/O and has a BBU present
Write Policy SD#—Wx	The write policy for system drive # is set to write through (WT) or write back (WB)

Error Codes

Table A-2. Error Codes

Error Code	Description
0x0103	Host block count is zero
0x0104	Operation requested is not implemented (invalid operation code)
0x0105	Parameter specified is out of bounds
0x0106	Controller or system drive or physical device is busy
0x0107	Operation has been terminated
0x0109	Illegal parameter specified in command
0x010a	First command to system drive
0x010b	Physical drives not yet spun up
0x010c	Initialization is in progress or already done
0x010d	Check consistency is in progress
0x010e	Bad data found in specified read range
0x010f	Firmware slave operation failed
0x0110	Migration already in progress
0x0111	Maximum allowable # of system drives already defined
0x0112	System drive to migrate is in CRITICAL mode
0x0113	System drive to migrate is not in ONLINE state
0x0114	Controllers are in dual active mode for Simplex MORE
0x0115	Failover still in progress
0x0116	Migrate command issued to system drive with more than one span
0x0117	Disk drive to add is already part of a system drive
0x0118	Disk drive to add is not in STANDBY mode

Table A-2. Error Codes (Continued)

Error Code	Description
0x0119	Multiple system drives defined on pd's to enlarge
0x011a	Invalid parameter in MORE data list
0x011b	The rebuild/migrate "rate" is set to 0xff
0x011c	A drive in system drive to expand is also in other system drive with more than 1 span
0x011d	The drive to add is too small
0x011e	No memory available to complete the command
0x011f	COD write to disk failed
0x0120	Device trying to get ready
0x0121	Waiting for start unit command
0x0122	Device not be able to get ready
0x0123	Command didn't complete because controller not active
0x0124	No more devices to report status or information on
0x0125	Max number of enclosures reached (32) enclosures
0x0126	More Get Environmental data than space to return data
0x0127	Parameter is valid, but not supported currently
0x0128	Device scan in progress
0x0129	RAID device type specified is not valid
0x012a	RAID device specified is not found
0x012b	Maximum number of COD groups (64) already used
0x0150	RAID device not available for configuration
0x0151	Maximum number of physical devices reached
0x0152	Maximum number of system drives reached
0x0153	Requested data length larger than allocation length
0x0154	No space available for new configuration
0x0155	Invalid field in configuration data
0x0156	Physical device already in use
0x0157	Data transfer count too small for command
0x0158	Device type specified in configuration data is invalid
0x0159	Device number specified in configuration data is invalid
0x015a	Device name already in use

Table A-2. Error Codes (Continued)

Error Code	Description
0x015b	Device specified does not correspond to a RAID device
0x015c	Cannot change RAID device type
0x015d	Cannot change RAID device stripe size
0x015e	Cannot change RAID device number
0x015f	Physical device not connected
0x0160	No COD groups present
0x0161	Bad number of drives to add with MORE
0x0162	User attempted spanning with MORE
0x0163	Physical device must be configured prior to MORE
0x0164	Physical device address was not at LBA 0 in MORE data
0x0165	Physical device only partially used - must used entire physical device
0x0166	System drive definition in MORE data has bad field(s)
0x0167	No SES device found running
0x0168	The configuration data containing the logical device definition is invalid
0x0169	RAID device numbers are out of sequence
0x016a	RAID device is found, but is not configured
0x016b	Configuration data contains an invalid stripe size

Appendix B
Controller, Logical Device, and Physical Device Parameters

This appendix describes the Controller, Logical Device, and Physical Device Parameters in greater detail than is provided in “Get and Set Controller Parameters” on page 2-6, “Get and Set Logical Device Parameters” on page 3-41, and “Get and Set Physical Device Parameters” on page 3-46.

Each Mylex controller is shipped from the factory with initial settings that have been found to work well in a majority of applications and environments. These settings are listed as the controller, logical device, and physical device parameter settings and vary depending on product and user requirements. Some parameters are product or configuration dependent and do not have a recommended default setting provided.

Default values are provided; however, these are only examples of the most common settings. User requirements are not always the same as the suggested default settings, so you may want to modify certain settings. Additionally, if you are going from a simplex configuration to a dual-active controller configuration, certain controller parameters must be changed to accommodate the new dual-active controller configuration.

A thorough understanding of the parameters and settings is strongly recommended before modifying the current settings and creating a configuration.

Controller Parameters

The Controller Parameters are described individually in greater detail than is provided in Table 2-1 on page 2-2. Some parameters include notes of special interest and known side effects of using certain parameter settings

1. Reassign Restricted to One Block

Default=Disabled (0) and requires controller reset. The Reassign Restricted to One Block function limits reassigning failures to the single failed block. This parameter is limited to recovered errors and medium errors. If the sense on the error does not indicate one of these errors, then this setting does not apply. When the Reassign Restricted to One Block is disabled, all reassigns are for the entire I/O process, possibly a large number of blocks where not all have failed.

2. True Verify

Default=Disabled (0) and requires controller reset. If this option is disabled, the Verify command returns a status without data comparison. If this option is enabled, the Verify command compares data before returning a status. Enabling this parameter compromises performance.

3. Disk Write Through Verify

Default=Disabled (0) and requires controller reset. The Disk Write Through Verify function enables Force Unit Access for reads and writes during error handling. Force Unit Access bypasses the cache and forces all reads and writes directly to or from the disk.

Side Effect: For some devices, enabling Force Unit Access reduces sequential write performance by 86%.

4. Read Ahead Enable

Default=Enabled (1). The Read Ahead Enable function improves data retrieval performance by allowing the controller to read into cache a full stripe of data at a time. This greatly improves the percentage of cache hits. For small transfers, the read ahead algorithm helps with performance.

For example, if the stripe size is set to 8K and the host requests 1K of data, when this function is enabled the controller reads ahead the full 8K. When the host requests the next 1K block, that data is already in the controller's cache. This function should remain enabled during normal controller operation.

5. Automatic Rebuild Management

Default=Enabled (1) and requires controller reset. The Automatic Rebuild Management function allows the controller to take autonomous actions when a failed disk has been replaced or a configured online spare disk drive is present.

The Automatic Rebuild Management function works in conjunction with Fault Management and features in SAF-TE and SES certified disk array enclosures to detect the removal of a failed disk drive. The Automatic Rebuild Management function also performs an automatic rebuild after a replacement disk drive is installed into a redundant (fault tolerant) array (RAID 1, RAID 3, RAID 5, and RAID 0+1).

Side Effect: Without this enabled, a host must issue the rebuild command.

6. Operational Fault Management

Default=Enabled (1) and requires controller reset. The Operational Fault Management function allows the controller to take autonomous actions when a failure occurs. Actions that the Operational Fault Management function monitors and reports include drive failures, background activity completion status, and enclosure events. This function should remain enabled during normal controller operation. Do not disable this function unless specifically instructed to do so as part of a trouble-shooting diagnostic activity. The Operational Fault Management function works in conjunction with Automatic Rebuild Management and features in SAF-TE and SES certified disk array enclosures to detect the removal of a failed disk drive. A controller reset is required before this parameter takes effect.

Side Effects: Without Operational Fault Management enabled, a host program or operator must handle all failure cases.

7. Super Read Ahead

Default=Disabled (0) and requires controller reset. The Super Read Ahead function increases performance for applications that must access large blocks of sequential data. This option only improves performance for large sequential read operations and has no effect on write operations. This function incorporates intelligent data request monitoring to track data requests by the host. With Super Read Ahead enabled, the controller detects requests for data that are stored in sequence on the drives. It reads the data into the cache so that the cache remains at least one request ahead of the host. This function should remain disabled during normal controller operation.

8. Rebuild and Check Consistency Rate

Default=50. The Rebuild and Consistency Check Rate parameter approximates one-half of the percentage of available rebuild cycles to be used. CPU utilization is always shared with data traffic. This function also determines the amount of resources the controller devotes to Consistency Check and MORE operations. Integer values from 0-50 can be defined. Entering a value of 50 means that all of the resources that can be dedicated for the operations are utilized. For low priority and high array performance, specify a lower value. For high priority and reduced array performance, select 50. This parameter takes effect immediately, without resetting the controllers.

9. Device Combing

The Device Combing function provides device queuing coalescing optimization. The function enables data traffic coalescing (combining of address adjacent I/Os) on the traffic of each device. This joins the data from adjacent I/Os into a single I/O to improve performance. This parameter takes effect immediately, without resetting the controllers.

10. Disk Startup Mode

Default=Autospin (0). The Disk Startup Mode function controls how the disk drives in the array are started (spun up). There are three different startup modes that may be selected by the user.

- AUTOSPIN (0)—The AUTOSPIN mode issues start commands to all devices automatically. This mode waits the amount of time specified in Startup Delay 1, issues Start Unit commands to the devices as specified in Startup # Devices, then waits the specified Startup Delay 1 again. This cycle repeats until all devices have been issued Start Unit commands. This mode proceeds with a sequence delay, specified by the SCSI Start Delay 2 parameter, while the drives become ready. Ready is equal to the *on power* spin-up mode. The sequence delay will not exceed a maximum of 75 seconds. The sequence delay is normally 0 when drives are jumpered to spin immediately on power-up, but can be set to a number of seconds for a target ID-based motor spin delay (where the drive has power immediately, but waits n seconds multiplied by its target ID before starting its motor).
- PWRSPIN (1)—Devices spin on power application. This mode is designed for systems where drives are powered on in sequence by the drive enclosure. This mode waits the amount of time specified in Startup Delay 1, after which the first bank of devices is expected to be ready. The first bank of drives are then checked. This wait-check cycle repeats for each subsequent bank of drives. Startup # Devices is ignored for this mode. The Startup Delay 1 is set to the drive power-on-to-spin time and the SCSI Startup Delay 2 is set to the enclosure delay between powering banks of drives. This mode assumes all drives with the same target ID are in a bank.

- WSSUSPIN (2)—The controller waits for the host to issue an SSU (Start/Stop Unit) command then performs the Autospin mode described above. This mode causes the drive initialization to stall until the host sends the controller a start unit command, then proceeds with the Autospin mode.

Table 1 details the relationship between Disk Startup Mode, Startup Number of Devices, Startup Delay 1, and SCSI Startup Delay 2.

Table 1. Disk Startup Mode Parameters

Disk Startup Mode	=	AUTOSPIN	PWRSPIN	WSSUSPIN
Startup # Devices	=	#Devices/spin	Undefined	#Devices/spin
Startup Dly 1	=	Device spin wait	Initial delay	Device spin wait
SCSI Start dly 2	=	(0)	Sequence delay	(0)

11. Startup Number of Devices

Default=2 and requires controller reset. This option specifies the number of physical disk drives to be spun up at one time. Possible settings are 1 through 8. This parameter is ignored if PWRSPIN mode is selected.

12. Startup Delay 1

Default=6 and requires controller reset. The Startup Delay 1 function varies with the selection of the Disk Startup Mode parameter. If AUTOSPIN selected, this function specifies the number of seconds between physical device spin-up cycles. If PWRSPIN is selected, this function sets the number of seconds before the controller issues start up commands. This value should be set to the device's power-on-to-spin time. Possible settings are 0 to 255 seconds.

13. SCSI Startup Delay 2

Default=0 and requires controller reset. This parameter is also referred to as sequence delay.

For AUTOSPIN mode, the SCSI Startup Delay 2 function sets the number of seconds for a SCSI ID-based motor spin delay. The device has power immediately, but waits n seconds multiplied by its SCSI ID before starting its motor. The SCSI Startup Delay 2 function is normally set to 0 for AUTOSPIN mode.

For PWRSPIN mode, the SCSI Startup Delay 2 function sets the number of seconds between physical device startup cycles. The value should be set to the enclosure's power delay between powering banks of devices.

Possible settings are 0 to 255 seconds.

14. Vendor Unique Test Unit Ready

Default=Disabled (0) and requires controller reset. The Vendor Unique Test Unit Ready (TUR) function enables a vendor unique TUR response sent to an offline LUN. If disabled, a hard error status (4/00/00) is returned. If enabled, a Not Ready status (2/04/03) is returned.

15. Disable Check Condition for Invalid LUN

Default=Enabled (1) and requires controller reset. When enabled, disables Check Condition for an invalid LUN. This effects the handling of the INQUIRY command when the referenced LUN is invalid. If enabled: The INQUIRY command returns data with the peripheral qualifier indicating that the peripheral device is not connected. If disabled: the INQUIRY command will be failed with a Check Condition of Illegal Request, LUN Not Supported. A controller reset is required before this parameter takes effect.

16. No Pause on Controller Not Ready

Default=Disabled (0) and requires controller reset. The No Pause on Controller Not Ready function turns the pause off or on for certain commands when the controller is not ready. Normally, when the controller is starting up, certain commands encounter a pause. This only happens when the controller has not reached STARTUP COMPLETE. The pause lasts one second. The affected commands are:

Prefetch	SCSI OP 0x34
Read/Write	SCSI OP 0x08 / 0x0a
Read/Write Extended	SCSI OP 0x28 / 0x2a
TUR	SCSI OP 0x00
Verify	SCSI OP 0x2f
Write Verify	SCSI OP 0x2e

17. Disable Queue Full Status

Default=Disabled (0) and requires controller reset. Enabling this parameter sets the controller to return a busy status when a queue full condition is detected. Disabling this parameter sets the controller to return a queue full status. When a command is received and the controller detects a queue full condition, it normally returns Queue Full status. This parameter is intended to help hosts that are confused by queue full.

18. Disable BUSY Status During Failback

Default=Disabled (0) and requires controller reset. The Disable BUSY Status During Failback function allows the controller to disregard new requests without returning a BUSY status. If enabled, during failback, the surviving controller ignores all new requests and does not return any status. If disabled, the surviving controller returns a BUSY status to new commands received from the host during the cache flush operation.

19. SAF-TE Data for UPS Support

Default=Enabled (0). The SAF-TE Data for UPS Support function provides UPS monitoring via the SAF-TE vendor unique bytes described in the SAF-TE specification. The current state of all SAF-TE inputs can also be determined via SAF-TE passthru commands.

Enabled (0)—UPS monitoring is enabled if it is also supported by the system enclosure.

Disabled (1)—UPS monitoring is disabled.

UPS monitoring currently supports the following input/outputs.

- AC FAIL (input)—The UPS has detected a loss of AC. The controller switches to conservative cache for this event.
- BAT LOW (input)—The UPS has detected that its battery power is now limited. The controller switches to conservative cache for this event.
- Shutdown (output)—If AC FAIL and BAT LOW are active and the cache has been flushed, the controller issues a shutdown signal to the UPS.

This parameter takes effect immediately, without resetting the controllers.

20. Node Name Retention

> ⚠ ***Caution***
>
> If the host uses node names to locate logical devices, or system drives, this option must be enabled, or access to data may be lost.

Default=Disabled (0) and requires controller reset. The Node Name Retention function disables/enables a failed controller's node name to be retained through a controller failure. When disabled, each controller shares its node name with its partner controller through failover; however, when failback occurs, the replacement controller uses its own node name. When enabled, each controller shares its node name with its partner controller and those names are used through all phases of failover and failback.

Side Effects: Not having this bit set has serious ramifications if the controllers are connected to a host that uses node names to locate logical devices.

21. Failover Topologies

This option requires controller reset. This option sets the Fibre Channel port topology. The choices are:

- Inactive Port (0)—One active and one inactive port per controller. The active port is for normal traffic while the inactive port is for the partner's traffic when it is failed over. This topology is only recommended for the FF controller.
- Multiport (1)—All host ports are active and connected to individual fibre loops. This topology requires alternate path software and does not support transparent controller failover/failback.
- Clustering (2)—This topology requires a clustering operating system. This topology is not currently supported.
- Multi-TID (3)—Provides the controller with the ability to function as multiple target ports on a single arbitrated loop. During failover, the surviving controller enables a virtual port, impersonating the ports from the failed controller. This topology requires ISP2200 processors, available on the FFx and FF2.

- Master-Slave (4)—Master/Slave topology requires one active controller while the other controller remains inactive. If the active controller fails in the Master/Slave topology, the surviving controller joins the loop and assumes the responsibilities for the failed controller. This topology is not recommended for use with firmware version greater than 5.4.

22. Override Multiport Reset

The Override Multiport Reset restricts internal resets to ports that have logical devices reserved through that port. If enabled, an internal reset is executed by a port only if a logical device has been reserved through that port. If disabled, internal resets are not qualified by logical device reservations. This parameter takes effect immediately, without resetting the controllers.

Side Effects: When this bit is set, only the Reset Event receiving port and the reserved port are reset.

23. Reset Propagation

Default=Disabled and requires controller reset. The Reset Propagation function allows a port to issue an Internal Reset without causing a Reset Event to occur on its attached interface. If enabled, a port that issues an Internal Rest propagates the reset by causing a Reset Event to occur on its attached interface. If disabled, A port will not causes a Reset Event on its attached interface as part of issuing an Internal Reset.

Side Effects: This is a legacy command. This parameter is not applicable to fibre host controllers and has no effect.

24. Serial Port Baud Rate

Default=19200 and requires controller reset. The Serial Port Baud Rate function sets the baud rate of the serial port when in VT100 or Debug mode. This is ineffective when in SLP mode. Options are 3= 2400, 4=4800, 5=9600, and 6=19200.

25. Serial Control

Read Only. The Serial Control function is a read-only function that controls the following serial port parameters.

CBITS7	0x01	/* 1=> 7 bits */
CSTOP1	0x02	/* 1=> 1 stop bit */
CSTOP15	0x04	/* 1=> 1.5 stop bits */
CPARDIS	0x10	/* 0=> parity enabled */
CPARODD	0x20	/* 0=> parity even if enabled */
C2_SLP_CTL_UNUSED_BITS	0xc8	

26. Serial Port Usage

Default=SLP/VT100 (3) and requires controller reset. The Serial Port Usage function sets the serial port to be used as either the SLP/VT100 port or the debug port. The debug port is for development use only. Select SLP/VT100 if you are using the serial port.

27. Frame Size Control

Default=2KB (0) and requires controller reset. The Frame Size Control function sets the host fibre channel data frame size to either 512 bytes, 1KB or 2 KB. A frame size of 2 KB is recommended since it provides the largest packet transfers and the most throughput.

28. Smart Large Host Transfers

Default=Enabled (0). The Smart Large Host Transfers function allows selection of Coalesce (fewer disconnects on large transfers) or As Available (more disconnects) on host data transfers. This function is most effective on SCSI, but has some benefit on fibre channel systems. The Smart Large Host Transfers function takes effect for transfers larger than the stripe size. This parameter takes effect immediately, without resetting the controllers.

29. PCI Latency Control

Default=Short (0) and requires controller reset. The PCI Latency Control function allows adjustment of the Fibre Channel chip's use of the PCI bus. This function controls the amount of data each processor can burst across the primary bus before relinquishing bus ownership to the next device. PCI Latency Control takes affect only when both ports are active and are arbitrating for the bus. PCI Latency Control allows the integrator to tune the controller's operating parameters for specific applications. For maximum throughput, LONG is recommended and is equivalent to the time necessary to transfer 1024 bytes; MEDIUM is equivalent to 684 bytes and SHORT is equivalent to 512 bytes.

30. Automatic Failback

Default=Disabled (0) and requires controller reset. When enabled in a dual-active controller system, Automatic Failback allows automatic recovery of a partner controller when a replacement is inserted. If you enable this option, you must also enable the *Duplex Fault Signals* parameter.

31. Force Simplex

Default=Disabled (0) and requires controller reset. The Force Simplex function allows duplex (dual-active controller) firmware to function in a simplex (single controller) environment. The Force Simplex function forces the duplex firmware to ignore some of the dual-active operations.

> ⚠ ***Caution***
>
> Do not enable Force Simplex unless it is required. Disabling Force Simplex and returning to a dual-active mode requires that each controller be reconfigured independently of the other controller. This is accomplished by removing one controller from the system, reconfiguring the remaining one, then swapping the controllers and reconfiguring the second controller; then reinstalling the first controller.

32. Conservative Cache Mode

Default=Disabled (0). The Conservative Cache Mode function is provided to allow a controller an extra degree of data safety when operating in a degraded state. This function switches write-back caching to write-through operation after a critical system component fails or a degraded state is detected. When the degraded condition is resolved, write-back caching operations resume. This parameter takes effect immediately, without resetting the controllers.

> **☛Note**
>
> Conservative Cache Mode is entered automatically when the UPS signals AC failure or a low battery, power supply failure, over temperature condition, partner controller failure, MORE operation, or SES failure exists.

Side Effect: There is a performance loss during Conservative Cache Mode. Enabling this option has no effect during normal operation.

33. Duplex Fault Signals

Default=Disabled (0) and requires controller reset. . The Duplex Fault Signals function is provided to inform a controller that certain signals should be used to detect the presence or absence of a partner controller.

> **☛Note**
>
> If you have enabled *Automatic Failback*, select Enabled for this function also. This parameter is necessary for hot plugging controllers and automatic failback.

34. Duplex Fault Signals on Channel 4

Default=Disabled (0) and requires controller reset. The Duplex Fault Signals on Channel 4 function is only supported on the DACSX controller. This function informs a controller that certain signals should be used to detect the presence or absence of a partner controller. A controller reset is required before this parameter takes effect.

Side Effects: This is a legacy command. This parameter is not applicable to fibre host controllers and has no effect.

35. Host SCSI Reset Delay

Default=No Reset (0) and requires controller reset. The Host SCSI Reset Delay function allows a controller to rest the host in failover and failback situations. If No Reset (0) is set, no SCSI bus reset is generated on the host channel(s) after a failover or failback occurs. If Reset Delayed (1-14) is set, a SCSI bus reset is generated on the host channel(s) approximately 1-14 seconds after a failover or failback occurs. If Reset Immediately (15) is set, a SCSI bus reset is generated immediately with no delay.

> ☞**Note**
>
> If you are using the Solaris™ operating system, set this parameter to 5.

Side Effects: This is a legacy command. This parameter is not applicable to fibre host controllers and has no effect.

36. Simplex—No Reset

Default=Disabled (0) and requires controller reset. The Simplex—No Reset function inhibits the reset signal normally sent from one controller to another controller in a dual-active controller system. This parameter is intended for use in simplex environments only.

37. Queue Limit

Default=32. The Queue Limit function specifies allowed queue depth for tagged commands to all attached physical device. This is further limited to the device's own tag limit. Allowed values are 1 to 230. A setting of 1 is similar to no tags. If using coalescing, set the queue tag limit to 2. This parameter takes effect immediately, without resetting the controllers.

38-41. Hard Loop IDs

Default=Disabled, (0) and requires controller reset. This option allows you to enable or disable use of the controller/host port and, if enabled, to define the hard loop ID. Specifying the hard loop ID means that the same ID is always used. The valid range for loop IDs is from 0 to 127. A value greater than 128 + n or 0x80 + n indicates that hard loop IDs are enabled and n is equal to the loop ID.

Side Effects: Fibre channel arbitrated loop nodes acquire loop IDs in this order: Previous (LI_PA), Hard (LI_HA), Soft (LI_SA). Any soft ID is used in the next LIPA cycle.

42-43. Controller Name

Read only. The Controller Name function allows the user to assign names to the controllers. This parameter takes effect immediately, without resetting the controllers. This parameter is not supported by VT100 at this time.

Logical Device Parameters

Changing the Logical Device Parameters cannot be performed until logical devices have been created. Several of the Logical Device Parameters are not changeable, or are set during the creation of a new configuration. These parameters are provided for informational purposes only. The write policy parameter is the only Logical Device Parameter that can be modified.

RAID Level

Read Only. This is the RAID level associated with the configuration. This is the RAID Level selected during the create new configuration procedures. Refer to Table 2-2 on page 2-20 for more information on RAID Levels.

Logical Device State

Read Only. This represents the current device state. Refer to “Show Drives, Change Drive State” on page 3-14 for more information.

Raid Device Number

Read Only. The RAID device number is assigned by the firmware and is related to the RAID device type.

Stripe Size

Read Only. This is the stripe size assigned to the configuration during the create configuration process.

Read-Write Control

This parameter can be modified. This parameter changes the configured write policy. Write-Through writes data to the device before returning completion status to the host. Write-Back returns a completion status to the host as soon as the cache receives the data. The target device receives the data at a more appropriate time. This parameter takes effect immediately, without resetting the controllers.

Physical Device Parameters

Changing the Physical Device Parameters cannot be performed until The physical device has been configured into a RAID device.

Transfer Speed

Default=depends on device type and requires controller reset. The Transfer Speed function sets the maximum transfer rate for each device. The possible settings are 0 for asynchronous, 5, 10, 20, 40, 80, and 1000 for fibre.

> **☛Note**
>
> The default setting should be changed only if problems are encountered in communicating with a device. Do not change the default setting unless you are doing so as part of a trouble-shooting activity.

Transfer Width

Default=16 bits (2) and requires controller reset. The Transfer Width function determines the maximum data transfer width size in bits. The possible settings are serial, 8 bits, and 16 bits.

Appendix C
Glossary

Array

Multiple physical disks configured to behave has a single, independent disk.

Cache

Controller memory used to speed up data transfer to and from a disk.

Cache Flush

Refers to an operation where all unwritten blocks in a Write-Back Cache are written to the target disk. This operation is necessary before powering down the system.

Channel

A path for the transfer of data and control information between drives and the drive controller. Mylex disk array controllers have one or two host channels and up to six drive channels. Each drive channel can support up to 124 drives.

Consistency Check

Also referred to as a parity check. The Consistency Check function is used to verify the integrity of data on a system drive. It verifies that mirror or parity information matches the stored data on the redundant arrays (RAID 1, RAID 3, RAID 5, or RAID 0+1). If the parity block information is inconsistent with the data blocks, the controller has the ability to correct the inconsistencies using Consistency Check with Restore function.

Disk Striping

The practice of dividing data into blocks and writing them across multiple drives for increased performance.

Drive Group (or Drive Pack)

A drive group is a group of individual disk drives (preferably identical) that are logically tied to each other and are addressed as a single unit.

Dual-Active

A disk array system with two identical controllers handling host I/O requests. Both controllers are capable of taking over the host traffic operations of the other controller in the event of a failure. Also referred to as *duplex*.

Environmental Device

AEMI, SAF-TE, or SES. Environmental monitoring devices that detect drive insertion or removal, power supply malfunction, fan malfunction, temperature extremes, and UPS AC failure.

Failback

A process by which a controller releases its partner controller from reset and allows it to re-assume its duties.

Failed Drive

A physical disk drive that has failed to operate properly or has been marked Offline Failed by the controller.

Failed Controller

One of the controllers in a dual-active configuration has been determined to be malfunctioning by its partner.

Failover

A process by which a controller puts its partner controller in reset and assumes its duties.

Fibre Channel

A data transfer interface technology that allows for high-speed I/O and networking functionality in a single connectivity technology.

GAM (Global Array Manager)

A software utility developed by Mylex for use with Mylex controllers. This utility is used to configure, manage, and monitor RAID arrays connected to one or two Mylex controllers.

Hard Loop ID

A controller's preferred loop ID (as specified by the saved configurations). The controller attempts to acquire hard loop IDs during the LIHA (Loop Initialization Hard Address) phase of loop initialization.

Hot plug

The action of removing and inserting a controller while system power is applied. This insertion and removal can occur while the other controller in a dual-active system is active. Hot plug **does not** include the removal of a functioning controller.

Hub

A Fibre Channel device that connects nodes into a logical loop. Hubs connect multiple drive channels to one or two host channels. The hub detects when a node has been inserted or failed and automatically adds the new node or removes the failed node while maintaining the loop.

I/O

Input/Output. Refers to disk reads and writes.

LCD

Liquid Crystal Display on the front panel of the controller enclosure. The LCD provides a monitor display for error and status messages.

Logical Device

Disk storage space on one or more physical drives which appears to the computer as one drive. Sometimes referred to as a system drive.

Logical Device States

The current operational state of a system drive: Offline Failed, Online Optimal, Online Critical, or Online Critical and Rebuilding.

Logical Unit

Disk storage space on one or more physical drives that appears to the computer as one drive. Sometimes referred to as a system drive or a logical drive.

Logical Unit Number (LUN)

A SCSI representation of a system drive on a given channel and target ID. This may be a single device or an array of devices configured to behave as a single device.

LUN Mapping

A method whereby a LUN ID is assigned to a system drive, allowing a LUN to be made accessible through one or more host ports. The LUN assignments are per host port and are independent of the assignments on other host ports. System drives may be assigned only one LUN per host port.

By not assigning a LUN to a system drive on a particular host port, that system drive is made inaccessible to that host port.

LUN mapping is a component of SANmapping.

Mirroring

Refers to the 100% duplication of data on one disk drive to another disk drive. Each disk is the mirror image of the other; RAID Level 1.

Parity

Refers to a method of providing complete data redundancy while requiring only a fraction of the storage capacity of mirroring. All data and parity blocks are divided between the drives in such a way that if any single drive is removed (or fails), the data on it can be reconstructed using the data on the remaining drives.

Partner Controller

In a dual-active configuration, the partner controller is the controller that is not being accessed. Convention has assigned controller 1 as the partner controller.

Physical Device States

Refers to the drives current operational status: Unconfigured Offline, Commanded Offline, Offline Failed, Offline Missing, Offline Warm Spare (not supported at this time), Online Optimal, Online Critical, Online Hot Spare, or Online Rebuild.

Physical Disk Drive

A single hard disk drive. Each physical drive is assigned a unique identification address. Sometimes referred to as a physical device.

Previous Loop ID

The loop ID acquired during a prior loop initialization. The controller acquires previous loop IDs during the LIPA (Loop Initialization, Previous Address) phase of loop initialization.

Primary Controller

In a dual-active configuration, the primary controller is the controller that is currently being accessed. Convention has assigned controller 0 as the primary controller.

Online Hot spare

A physical drive not part of a system drive that the controller can use to automatically rebuild a critical system drive. The hot spare drive must have at least as much capacity as the largest drive in the array or the rebuild may not start.

RAID

RAID stands for Redundant Array of Independent Disks.

RAID levels

Mylex Disk Array Controllers support four RAID Advisory Board-approved (RAID 0, RAID 1, RAID 3, RAID 5) and two special RAID levels (RAID 0+1, and JBOD).

RAID 0

The controller stripes data sequentially across multiple drives without redundancy.

RAID 1

Disk mirroring—controller duplicates data from one drive to another.

RAID 3

Stripes blocks of data across all drives. Maintains parity information which can be used for data recovery.

RAID 5

Stripes blocks of data and parity information across all drives.

RAID 0+1 (Mylex RAID 6)

Combines the benefits of disk mirroring (RAID 1) and data striping (RAID 0).

JBOD (Mylex RAID 7)

The controller treats a single drive as a stand-alone disk and provides a

high-performance cache.

Rebuild

Refers to a physical drive state where the drive is in the process of being rebuilt. During this process, data is regenerated and written to the disk drive.

Redundant Array

A RAID level that provides complete data redundancy. In the event of a drive failure or removal, the data can be reconstructed using the data on the remaining drives.

Replacement Controller

A controller that replaces a failed controller.

Replacement Disk Drive

A drive that replaces a failed drive. See also hot spare.

Reset Controllers

This operation performs a “warm” power cycle on the controllers. A controller reset is required after changing some controller parameters and is recommended after making any changes to the configuration.

SAF-TE

SCSI Access Fault-Tolerant Enclosure provides monitoring of power supplies, fans, and temperature in the cabinet.

SANmapping

The SANmapping feature restricts host access to configured system drives similarly to the Programmable LUN Mapping feature. Programmable LUN Mapping is incorporated into the SANmapping feature. SANmapping is intended for use in configurations in which multiple host computers attach to one or more Mylex controllers or a Storage Area Network (SAN)

configuration. The host computers are attached to the controller(s) through a fibre channel arbitrated loop or through a switch.

SES

SCSI-3 Enclosure Services provides support for disk drives, power supply, temperature, door lock, alarms, UPS, and enclosure services controller electronics. The SES process polls each SES device once every 10 seconds.

Simplex

A system with only one controller or a mode of operation where only one controller is active or present. To perform a MORE (Mylex Online RAID Expansion) operation, a dual-active system must be in simplex mode.

SCSI (Small Computer System Interface)

A technological standard that defines connections between computers and peripheral devices.

Stripe Size

The stripe size is defined as the size, in kilobytes (1024 bytes) of a single I/O operation. A stripe of data is divided over all disks in the drive group.

Striping

Refers to the storing of a sequential block of incoming data across multiple drives in a group. This storage method increases the disk system throughput by ensuring a balanced load among all drives.

Surviving Controller

A controller that has determined that its partner controller in a dual-active pair has failed and has assumed the duties of both controllers.

System Drive

Disk storage space on one or more physical drives which appears to the computer as one drive. Sometimes referred to as a logical device or logical drive.

System Drive Affinity

System drive affinity defines the host port(s) and controller(s) through which a particular system drive may be accessed. System drives are presented to the host as LUNs.

Target ID (TID)

Refers to the SCSI ID or the Fibre ID of a device attached to a controller. Each drive channel can have up to 15 attached devices.

VT100

Terminal-emulation interface that allows the user to access the controller through a PC without an additional utility.

Write-Back Cache

Refers to a caching strategy whereby write operations result in a completion signal being sent to the host operating system as soon as the cache receives the data to be written. The target drive receives the data at a more appropriate time in order to increase controller performance.

Write-Through Cache

Refers to a caching strategy whereby data is written to the drive before completion status is returned to the host operating system. This caching strategy is considered more secure, since a power failure is less likely to cause a loss of data; however, a write through cache results in a slightly lower performance.

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